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ABSTRACT

This report presents a cost-effectiveness model for preservice and inservice teacher training in Australia, using a microteaching technique, relating educational (student-centered) factors and cost (management-centered) factors. The report is divided into four parts: (a) a literature survey and the experimental study; (b) attachments to Part A; (c) a selected bibliography on microteaching; and (d) additional supporting material. Part A, Section 1, is devoted to the development of an experimental microteaching model, and presents an investigation of microteaching and a literature survey as background for the present research; planning, development, and implementation of an experimental program; design and data analysis of the program; a study of transfer effects from training to classroom practice; development of a cost model and discussion of general cost estimates obtained from the model; a consideration of the microteaching role in inservice programs; and a summary of findings. Part A, Section Two, presents an instrument for the measurement of skill attainment and details of a costing model and its use in costing a microteaching program. Part B, Attachments, presents (1) handouts to student teachers describing the microteaching program, (2) a description of the Monash (Victoria) self-instructional, inservice training program in technical teaching skills; (3) the transcripts of three inservice tape-recordings on low-order questions, high-order questions, and use of identification probing and redirection questions. Part C of the report presents an annotated bibliography of microteaching, including seven bibliographies, nine reviews, 451 general references, and 86 annotations. Part D, Additional Supporting Material, presents (1) a survey on the use of microteaching in teacher training institutions within the Greater Melbourne Area, and a report on a seminar on the development and implementation of microteaching at Melbourne University. (MJB)

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A COST EFFECTIVENESS STUDY OF THE USE OF MICROTEACHING IN THE EDUCATION OF TEACHERS

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J. C. CLIFT
H. D. BATTEN
G. BURKE
J. I. MALLEY

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1. A Survey of the Use of Microteaching in Teacher Training Institutions within the Greater Melbourne Area.
2. Microteaching Seminar Report.

PREFACE

During 1970, the Higher Education Research Unit (H.E.R.U.), at the request of the student members of the Diploma in Education Committee at Monash University, undertook a study into student reaction to the 1970 microteaching programme as used in the Faculty of Education. This study[1] raised a number of questions which were related to the limitations imposed upon the particular programme by the available facilities, equipment and staffing. In 1969-70 H.E.R.U. was also responsible for developing a counselling system for assisting academic staff with problems of teaching and general course management. Successful use was made of on-site videotape recording of lectures for later playback and discussion with the individual lecturer. It was felt that this system could be improved by the introduction of microteaching sessions following the discussion periods. The form of the microteaching and how it could best be fitted into the overall system to provide the most effective counselling situation was considered to be an important research question requiring urgent attention.

The solution to these problems arising from the use of microteaching in the pre-education and in-service education of teachers appeared to have wide and significant implications in terms of policy and future planning. It appeared that even if the effectiveness of microteaching as a technique were accepted, there still remained two important questions requiring urgent attention.

(a) What constituted the most effective microteaching situation?

(b) What were the differences in both capital and recurrent cost between the microteaching system and current systems for achieving similar objectives with both small and large numbers of students?

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[1] Clift, J. C. (1970). *Student Reaction to Microteaching.* H.E.R.U., Monash University, Australia.

These questions suggested the need for a cost/effectiveness model.[2] Such a model relating the educational or student centred factors with the cost or management centred factors would have general applicability in aiding decision-making relating to teacher education whether this was pre-service or in-service and whether the teacher was at the secondary or tertiary level.

It was agreed that a study aimed at producing a cost/effectiveness model would require a team of researchers with differing specialities. To this end a research team was formed comprising a psychologist, an educationalist and an educational economist. An approach was then made to the Australian Advisory Committee on Research and Development in Education (AACRDE) for a grant to finance what was considered to be a two-year project. The Committee responded with a generous grant, and so a project was undertaken to:

(a) Devise the most effective method of using the microteaching technique in the pre-service education of teachers.

(b) Devise the most effective method of using the microteaching technique in providing in-service education to teachers.

(c) Calculate the cost/effectiveness of the microteaching technique when used in the pre-service and in-service education of teachers.

The research team was then joined by Mr Jeff Malley, who undertook the full-time task of implementing the project.

As the original project progressed an extensive bibliography was prepared and, together with an annotation of the more important articles, forms Part C of this report.

During the initial stages of the project it was decided to survey the current use of microteaching in the Greater Melbourne area. The report of this survey is enclosed in Part D, 'Additional Material'. It became obvious, from the information gathered, that people had varying concepts of what constituted a microteaching programme. This led the research team into the preparation of a seven-minute videotape to explain the term 'microteaching'. This tape, entitled *This is Microteaching*, was used to introduce staff and students to the concept prior to the pre-service programme.

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[2] The term 'effectiveness' as used in this statement refers to the degree of mastery and the quality of the learning obtainable from the technique.

Towards the end of 1972, at the request of the Teaching Methods staff of Melbourne University, a seminar on the problems associated with the introduction and implementation of a microteaching programme was organised. A brief report on this seminar is enclosed in Part D of this report.

Additional work was also undertaken for a co-operative exercise with a team of researchers working on a microteaching project at a more general level, but also sponsored by the AACRDE. The results of this later study have since been published.[3]

JOHN C. CLIFT

Chief Investigator

December 1974.

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[3] Turney *et al.* (1973). *Microteaching Theory and Practice.* Sydney University Press.

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In addition to the grant from the Committee, the project could not have been completed without the support, advice and assistance of all the staff of the Higher Education Research and Advisory Unit, Monash University. In particular, a special thanks is due to Ron Crossley, who provided many hours of technical advice and support.

AUTHORS

J. C. CLIFT	Director, University Teaching and Research Centre, Victoria University of Wellington.
H. D. BATTEN	Senior Lecturer, Faculty of Education, Monash University.
G. BURKE	Senior Lecturer, Faculty of Education, Monash University.
I. J. MALLEY	Educational Research Officer, Education Unit, Royal Melbourne Institute of Technology.

CHAPTER 1

THE PROBLEM AND RELATED BACKGROUND

INTRODUCTION

1.1. Microteaching emerged on the teacher education scene during a period of time when the nature of teacher education was a subject of unprecedented investigation and scrutiny from both within and without the teaching profession. Microteaching must therefore be seen as emerging from this particular era of teacher education, that is the late nineteen fifties and early nineteen sixties, when the direction, quality, volume and nature of research on teacher education differed significantly from previous generations of research in this area (Cyphert 1967, Ryan 1966, Callaway and Gleason 1963).

1.2. While the change in research on teacher education over a period of ten years has been observable in itself, the reasons for this phenomenon have been less clear: perhaps the span of an historical time perspective is needed to highlight the causes. However, there were events which one may point to, contemporary to the ten-year period in question, which helped to shed light on the environment in which microteaching emerged.

1.3. Following the jolt that the launching of Russian Sputnik gave to American administrators, not only in the field of defence and technology but also in education, the late nineteen fifties and early sixties became a period of time when more funds were made available to finance teacher education and teacher effectiveness research (Cyphert 1967, p. 148).

1.4. Alongside this injection of finance was a growth and transfer of knowledge and techniques from areas such as psychology, sociology, research methodology and administration to education research, which in particular marked a change in the trend of research on teacher education away from the survey type programme to the more scientifically acceptable type of controlled experimental programme (Cyphert 1967, Callaway and Gleason 1963, Ryan 1966).

1.5. Outside the fields of research and technology, the teaching profession at large was becoming more and more concerned with the relevance and professionalism of teacher training courses. With a new public interest in teacher accountability, and with a surge in pupil enrolment, and retention, the quality of teacher training reached beyond the professional domain into the public arena. Internal professional pressures as well as wider social pressures were forcing a change in the nature of teacher education and research on teacher education.

1.6. Most conventional teacher training programmes provided for a system of practice whereby a student teacher rehearsed and attempted to implement during a short length of time in an actual school the theories and strategies he or she had learnt during a more formal part of the teacher training course. It is now felt that in this traditional situation the student was expected to practice in a classroom atmosphere that many of them found threatening. What the student learnt in this situation may well have been dictated by its very complexity, and the practice of worthwhile skills was likely to be sacrificed to methods employed as a defence against a situation too complex for the student to handle. In fact, Sorenson (1967) showed that students paid little attention to what can be termed "theory of teaching", being more concerned with the demands of an existing system or, more specifically, with the demands of their supervisor. Other inadequacies of such programmes have been further listed by Berliner (1969) who included the lack of specific direction as to what teaching habits were worthy of emulating or which skills had been used correctly and the lack of opportunity for immediate practice of such skills.

1.7. The School of Teacher Education at Stanford University was particularly concerned with this aspect of teacher education programmes. They began innovating with role-playing students in a demonstration lesson and in 1963 introduced the first of their microteaching programmes which utilised the technology of television and the psychological concept of feedback.

1.8. One of the overriding factors in the research into teaching was the criteria of effectiveness. Over the years, measures of teaching effectiveness have been based on the total act of teaching and it was not until the nineteen sixties that the notion of considering 'microeffectiveness' was put forward by N. L. Gage (1963):

> *"Rather than seek criteria for the overall effectiveness of teachers in the many varied facets of their roles, we may have better success with criteria of effectiveness in small, specifically defined aspects of their role."*
>
> (p. 120).

1.9. Just as criteria of effectiveness has provided a problem for the research workers, so it has for the teacher trainer. How can one criticise a practice lesson unless there is some way of analysing the act of teaching? For the microteaching programme the Stanford School derived a list of component parts *"identified through an informal task analysis of teachers in their classrooms"* (Cooper and Allen 1970). These component parts were termed by the Stanford team *"component or technical skills of teaching"* and in their microteaching programmes it was these skills which the trainee practised.

DEFINITION

1.10. Microteaching developed as an aid to teacher training by providing a procedure which reduced classroom climate to a simpler and more controlled encounter. The trainee teacher was placed in a classroom situation in which the lesson was shortened in terms of time and complexity of task, and the number of pupils was reduced to more manageable proportions. Microteaching and the component skills analysis of the act of teaching arrived simultaneously on the education scene, and in much of the literature microteaching and the practice of the *"component skills of teaching"* were made to appear synonymous. They are not. While microteaching has become a technique for the practice of specific teaching behaviours, the technical skills approach, which attempts to analyse the act of teaching into individually component skills, developed at a later date to give microteaching *"direction and substance"* (Cooper and Allen 1970, p. 12).

1.11. The Stanford School believed that microteaching was real teaching (Allen and Ryan 1969, p. 2). This proposition has led to a discussion in the literature as to whether microteaching does or does not constitute a simulation situation. Cooper and Allen believed that microteaching was a simulation of the teaching act only if peers were used as school pupils.

1.12. They supported this stand on the grounds that the peers would be role playing, and that real teaching therefore did not take place. The criterion of Cooper and Allen's argument was that with live pupils, real teaching and *ipso facto* real learning on the part of the pupils took place. If Cooper and Allen's assertion was right (and as the assertion came from the founding home of microteaching it must carry some weight), then much experimentation and practice, as has been going on in the name of microteaching, has really only been simulated microteaching. The point becomes an issue when comparing research reports on effectiveness of microteaching. Can the results of studies, which used in some instances peers and in other instances real live pupils, be compared with one another?

1.13. Continuing the argument of whether microteaching can be described as a real teaching situation or a simulation situation, McAleese and Unwin (1971), in surveying the literature, concluded that microteaching itself should be regarded as a form of simulated teaching.

1.14. McPherson (1971), in a more critical analysis of this question of real teaching versus simulation, stated his belief that perhaps the important difference between microteaching and simulation was the lack of reproducibility of the microteaching situation.

1.15. In assessing whether microteaching is or is not a true form of simulation, we find that the characteristic common to other simulation techniques, i.e., a contrived situation providing the opportunity to learn from experience without paying the price that results from wrong decisions or poor technique in the real situation (Craft 1967), is applicable to the microteaching model.

EXTENT OF USE

1.16. Much of the survey literature available on the use of microteaching within America, U.K. and Australia is dated as the adoption of microteaching occurred at an extremely rapid rate. Ward (1969) reported a widespread usage with Colleges of Education in the U.S.A. During 1966 and 1968 she surveyed 422 Colleges and Faculties of Education, of which 176 indicated that they used microteaching. Clift and Malley (1971) surveyed the Greater Melbourne area during 1971 and found that, of the 13 teacher training institutions approached, six replied that they were using some form of microteaching in their training programmes. A more recent survey by Turney *et al.* (1973), showed that approximately 50% of teacher training institutions in Australia were using some form of microteaching in their programmes. These surveys have also shown that the successful use of a microteaching programme depended as much on the planning, preparation and integration into courses as did the administration and organisation of the laboratory training session.

APPLICATIONS OF THE MICROTEACHING TECHNIQUE

1.17. Since the introduction of microteaching into elementary and secondary teacher education, the technique has spread into other training situations. Reports have appeared in the literature of its use in tertiary teacher education (Perlberg and O'Bryant 1969), the training of teacher supervisors (Aubertine 1967), the preparation of clinical supervisors and counsellors (Boone and Stech 1970, Buckleimer Goodman and Simons 1965), the training of salesmen (Johnson 1967), the development of interviewing techniques (Scaefer 1970) and in the preparation of vocational and technical teachers (McKitrick 1968, Smith and Woolschlager 1969).

1.18. A final criteria in the decision to implement a microteaching programme must be the time and cost factor, but studies in this area have been very restricted.

COST EFFECTIVENESS ANALYSIS

1.19. The last 15 years have seen the development of cost-benefit and cost-effectiveness studies in education (see Blaug 1970, OECD 1968). The term "cost-benefit" has always tended to be reserved for those projects in which the large majority of both the costs and the benefits may be measured in money terms. In those cases where the costs are measurable in money terms but the benefits are measurable on some other scale - such as pupils' performance on a standardised mathematics test - then the term "cost-effectiveness" has been used. The present study on microteaching falls in the cost-effectiveness area.

1.20. That it has been necessary to consider not only the effectiveness of alternative programmes, but also their cost needs little elaboration these days. If a particular technique of teacher training is superior on one or more criteria to an alternative, and not inferior on any criteria, then it is clearly more efficient if it costs no more than the alternative. If it is more effective but also costs more, then we cannot be sure it is more efficient - for what if the extra funds had been used to improve the effectiveness of the alternative? For example, suppose two teacher training programmes differ only in that the first includes a microteaching programme employing closed circuit television and the second includes microteaching without CCTV. We can conclude the first alternative is more efficient only if CCTV is avaiable free. If CCTV is not free, then we must compare the first alternative (including CCTV) with a situation involving equal expense. In other words, incarrying out a cost-effectiveness analysis, it is desirable that we be able to make effectiveness comparisons between alternatives of equal cost. On the other hand, it is possible to judge the efficiency of programmes which are seen to be equally effective by comparing their costs. In an experimental situation it is unlikely that we can prejudge the situation so accurately that alternative programmes are equally effective on all criteria. So it may seem more likely that judgements will be made on the basis of equal cost and differing effectiveness. However, there are many situations where the evidence on effectiveness is quite inconclusive and alternatives - which are seen as equally effective - can then be compared solely on the basis of cost.

1.21. Even in cost-benefit analysis outside the field of education, such as the Channel Tunnel project (Mishan 1971), many of the benefits are hard to estimate. Some monetary measure has to be attached to such factors as noise pollution, and benefits far into the future must be considered. But at least a means exists of summing the benefits into a single total. In cost-effectiveness analysis we may well be faced with situations in which no one alternative is superior to others on all criteria. The decision-maker must attach value weights to the various criteria before he can conclude that one or other alternative is superior. The problem is different in degree from that faced in most cost-benefit studies in that there is little general agreement on what are desirable objectives in education or the relative importance of different objectives.

1.22. Cost-effectiveness studies are most appropriate, therefore, when there are a few clearly defined and easily measurable objectives which are generally agreed on (Armstrong 1969). The present project, which attempts to assess alternative forms of microteaching in relation to the task of introducing a classroom lesson, appears suited to cost-effectiveness analysis even if the problems of objectives and measurement are not always easily dealt with. An early study of McCombs (1967) gives a breakdown of cost in terms of output for the Chicago Television College and recently the use of various instructional techniques and media, including CCTV, have been examined and methods of cost-effectiveness analysis developed (see, for example, Cumming and Dunn 1970, Wilkinson 1973, Layard 1973, Kelley 1970), but the particular technique of microteaching does not appear to have received attention in cost-effectiveness studies.

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CHAPTER 2

LITERATURE SURVEY AS BACKGROUND TO THE RESEARCH

LIMITATIONS IN THE REPORTED RESEARCH

2.1. Although the number of studies on microteaching has grown enormously in recent years, there still exist some severe limitations to the interpretation of the reported studies. A number of reports fail to provide details as to the actual microteaching programme and, in particular, give no information about the actual tasks practised. The criterion problem makes the inclusion of such information necessary before any cross comparison can be made with other studies. Task goals may vary from programme to programme, and task complexity may affect the analysis of performance levels from programme to programme. For example, it is extremely difficult to make a valid comparison between the studies of Limbacher (1971) and Kallenbach and Gall (1968) because no clear statement on the tasks or skills that trainees were asked to practice within the microteaching programme is provided. Similarly, Hiscox (1972), while specifying the skills that trainees were expected to practice, fails to provide details of the item criterion measures for each skill upon which the use of that skill was evaluated. Hence, the performance criteria for practising "stimulus variation", as put forward by Hiscox, may differ from the performance criteria contained within the Stanford University specific skills evaluative instrument on varying the stimulus. Unless complete specification of task and performance criteria are present in a study, the content aspect of the study becomes meaningless.

2.2. Another problem met in reviewing the literature and in particular in attempting to draw conclusion from the studies is the problem of measurement. Researchers in the microteaching field have either to develop their own measuring instruments or make use of measuring instruments developed by other users for their own use. The type of measuring instrument, and hence the criteria used by the experimenter, falls into three categories:

(a) a rating of the overall act of teaching, using such scales as the Stanford Teacher Competence Appraisal Guide;

(b) instruments to measure specific skills or behaviours, such as the Stanford skill instruments and the Far West Laboratory minicourse evaluative instruments;

(c) instruments, such as the Flanders Interaction Category, which provide an analysis of the teaching act rather than an evaluation.

2.3. Studies making use of one category of instrument are naturally not comparable with studies using the other categories. To add to this problem of interpretation of the research, a number of studies, such as those by Cooper and Stroud (1966); Tuckman and Oliver (1968); W.B. Johnson (1968) and Klingstedt (1970), have used crude gain between the pre- and post-test as their criteria measure.

2.4. As Manning and DuBois (1962) and O'Connor (1972) point out, the use of crude gain scores can result in spurious correlation in experiments into the effectiveness of learning techniques. The use of crude gain score implies that both the pre- and post-test scores are from identical interval scales with the same zero point. Crude gain has also been shown to provide a bias towards the low scorer when gain scores have a negative correlation with initial or pre-test scores. Conversely, when the correlation between pre-scores and gain scores is positive, the bias is towards the initially high scores.

EFFECTIVENESS

2.5. While it is true to say that there has been a considerable amount of research conducted into the microteaching techniques, this research has been concerned more with the arrangements and effects of the elements of a microteaching programme rather than with its overall effectiveness as a technique. A number of studies, Reed, *et al.* (1970), Harris, *et al.* (1970), Kilman (1969), have attempted to measure the effectiveness of microteaching in terms of student attitude change to teaching styles and subject matter, while another smaller group of researchers have concentrated on the effect of microteaching on student teacher attitudes to teaching, Reed (1971), Traill (1971).

2.6. An interesting study showing the effectiveness of microteaching in improving the evaluative skill of student teachers has been reported by Legge and Asper (1972). The authors report previous research showing the effectiveness of microteaching in developing evaluative skills in senior teacher trainees. In their own study they attempted to use the technique to accelerate the development of evaluative ability in their student teachers who were junior level students enrolled in a four-year training course. In addition to enrolment in the course on elementary curriculum, these students normally spent two hours per week in elementary classrooms. Twenty-six of these students were put through a Stanford type microteaching programme of five cycles over the 14-week period. The remaining 88 students of the course were used as controls. At the end of the 14-week period both the experimental and control groups viewed a 45-minute videotape of a teaching lesson using the Stanford Teacher Competence Appraisal Guide. In addition to the students, four master teachers from the staff of the college also completed a rating of the teaching lesson. The results showed a significant difference between the rating of the tape by the experimental and control groups with the experimental group ratings showing a close similarity to the master teacher ratings.

2.7. The studies so far noted have been primarily concerned with the development of attitudes and have appeared much later on the microteaching scene. By far the greatest number of studies considering the effectiveness of microteaching have been concerned with skill development. Schuck (1971) has reviewed the use of microteaching in a number of American institutions. The programmes reported can be considered as representative of the type of pre-service programmes employing some form of microteaching. While some of the programmes showed a significant difference in terms of teaching competence between experimental and control groups, other programmes showed the experimental groups to be at least equal to the control groups undergoing the more conventional programme.

2.8. The institution with the longest experience in the use of microteaching is Stanford University where the technique was originally introduced. Numerous articles have been written describing the Stanford programmes, their format and use. The rationale behind these programmes has been reported by Clark and Allen (1967). A programme was needed that was real, low-risk, adhering to learning theory, while providing a wide-ranging experience, but it also had to be economical. The authors claim that the programme introduced gave control over practice teaching, cut out the usual diversions and administrative details, allowed immediate feedback and practice opportunity, and saved time.

2.9. Studies relating to the effectiveness of the Stanford programme have been reported by Allen and Fortune (1966), Fortune *et al.* (1967), and Cooper and Stroud (1966). Before considering these studies, it is necessary to study in detail the Stanford programme as reported by Allen (1966). The total student teacher programme at Stanford, in addition to providing for continuous study in a number of areas such as the foundation of education, curriculum, instruction procedures and secondary education, also provided for continuous practice in teaching. This practice was given initially in the instructional laboratories, followed by nine months' paid studentship, during which time the intern was responsible for two classes for a complete academic year. Allen, in his report, "A New Design for Teacher Education", is careful to cite a number of individual features relating to this programme and stresses that the relationship between the features was considered to be a very important characteristic of the Stanford programme. The programme assumed a high level of academic competence of the student teachers themselves: they were Liberal Arts graduates with outstanding records, and had had a sound preparation in general education with a strong major in the teaching field. The actual programme was an integrated one in which use was made of microteaching clinics and classes, tutors/supervisors who were assigned a small number of interns (between 5-8) and whose tasks included the supervision and tutoring of the intern in his professional course work, his microteaching and his internship: *"It is through the tutor/supervisor that substantial individualization of training can take place"*. Feedback during the course was provided by video and 35 mm time lapse photography as well as by the use of the Stanford Teacher Competence Appraisal Guide (STCAG)[1] which was programmed on data processing for rapid feedback of results to the students. The general atmosphere of the Stanford programme was one of innovation in that the students could participate in current curriculum reform activities as well as in a number of other innovations being conducted at Stanford.

2.10. The 1965 Stanford Programme. Fortune, Cooper and Allen (1967) reported on the effectiveness of the 1965 Summer Clinic, that is, the instruction laboratory conducted prior to the nine months' internship. All the 140 interns were put through the instructional laboratory, in which a number of skills was taught. These skills were:

(a) initiating behaviours such as task direction, set behavioural objectives and diagnosis of learning;

(b) presenting of communication skills such as discussion, lecturing, question technique, pacing, frame of reference and distinguishing between concepts and illustration;

(c) consolidation skills;

(d) monitoring skills;

(e) evaluation skills.

The supervisors were Stanford doctoral students selected for their teaching competence. The pupils whom the intern taught were recruited from local high schools and were paid for their attendance; they were also given training in the use of the Stanford Teacher Competence Appraisal Guide. The general programme provided for a five-minute pre-diagnostic teaching test which was followed by three weeks of microteaching in which the students completed two cycles of microteaching - a cycle being a teach re-teach situation. In one cycle the supervisory conference would be conducted without videotape and in the other cycle the supervisory conference would be conducted with videotape. During the fourth week the students undertook a rest period from microteaching and received instruction in classroom discipline. In weeks 5-7 the students were divided into team teaching groups of 4-5 students. Each group prepared and presented under supervision a 12-day teaching unit. The teaching load was distributed equally among the interns in the form of 20-25 minute lessons which were followed in each case by a supervisory conference of approximately the same time. The criteria of success in this total programme was the students' score on the Stanford Teacher Competence Appraisal Guide. An analysis of results showed that there was a significant mean gain over the total programme as measured by pre- and post-diagnostic tests, and the authors concluded that the 1965 microteaching clinic was a success in obtaining teacher behaviour change along pre-planned lines in regard to the student teacher evaluation of its effectiveness.

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[1] STCAG is a global instrument. It was the first scale to be developed by Stanford and consists of a 17-category list of variables, each rated on a seven-point scale.

2.11. In the 1966 Stanford programme as reported by Cooper and Stroud (1966), the skills taught in the microteaching clinic were far more specific than those taught in the 1965 programme. The 1966 programme dealt in the first week with reinforcement and in the second week with varying the stimulus. Students underwent two cycles of microteaching (for each of the skills) with video supplemented feedback. In the third week students had a rest from microteaching and were involved in a study programme in higher order questioning. During the fourth and seventh weeks of the laboratory programme the students were engaged in microclass activity. Here, as in the 1965 programme, the students were broken up into teams, each team having to prepare and teach a 12-day teaching unit. The teaching load again was distributed equally among the interns in a form of 20-25 minute lessons, followed by supervisory conferences of a similar length. The programme differed, however, from the 1965 programme in that again the emphasis was more on skills rather than on the general approach to teaching, as had been the case in 1965. The skills specified for the microclass were first lecturing and the use of audio visual, secondly set induction, thirdly presentation and closure. During the remaining time of the laboratory programme the interns had a one-cycle microteaching session on illustrating and the use of examples and also practised student initiated questions. In the 1965 programme it was found that the Stanford Teacher Competence Appraisal Guide did not have items specifically designed for any specific skill, and so for the 1966 study instruments for measuring progress were developed in each skill. Unfortunately, these were not validated prior to use, but subsequent indications are that they were of reasonable validity and reliability.

2.12. An analysis of the microteaching programmes showed that the students did improve significantly from the pre- to the post-test: also as a result of the total programme the gain scores as measured by the pupils showed a positive gain, although the gain scores as rated by the supervisors showed a negative gain. Reasons for this difference between the pupils' and the supervisors' rating is not particularly clear.

2.13. In regard to the total laboratory programme, the authors were able to show that, using the Stanford Teacher Competence Appraisal Guide as a measure, there was a significant gain between the pre-and post-diagnostic tests and that the microteaching programme was effective in meeting the objectives laid down for the laboratory programme.

2.14. A study by Kallenbach and Gall (1968) compared the use of the Stanford microteaching approach in the training of elementary student teachers against the conventional classroom observation and student teaching experience normally used.

2.15. This study appears to be important for two reasons. In the first instance it is a control group type experiment testing the superiority of a microteaching programme over conventional teacher training techniques (where conventional teacher training is defined as being a combination of lecture and live school observation programmes) and, secondly, the authors attempted to replicate the control experiment of Allen and Fortune from Stanford.

2.16. Overall, Kallenbach and Gall found that there was no significant difference in teaching performance between the experimental microteaching group (N=19) and the control group (N=18) using as the criterion variable scores by subjects on the Stanford Teacher Competence Appraisal Guide (STCAG) and on the Instrument for the Observation of Teaching Activities (IOTA). Statistical techniques used were an analysis of difference between means using a t test, and analysis of covariance which adjusted for pre-training performance differences.

2.17. Unfortunately, Kallenbach and Gall did not provide enough descriptive detail on the nature of work given to the control group and the experimental microteaching group. The article reported that *"both groups took the same course work, lasting 10 weeks from June to September"* (p. 139), which required eight hours per week of trainees' time, and that for the remainder of this time, trainees gained practical experience through the microteaching programmes or the conventional 10 hours a week, to five weeks' commitment programmes in nearby schools (Designated the Student Teaching Programme).

2.18. The control group subjects *"observed, aided and taught 10 hours a week for an average of five weeks..."* (p. 139). The control group subjects attended one class with microteaching subjects in which particular specific teaching skills were discussed but, from this point on, Kallenbach and Gall failed to state the precise nature of the work performed, not only by the control group, but also by the experimental groups. No details of the content over the seven-week microteaching period sessions were given.

2.19. Another confounding of variables that takes place in this particular study, and in a number of other studies, is the difference in direct supervision hours and contact hours of trainees that takes place. It is reported that control group subjects only *"received limited faculty and district supervision"* (p. 137), yet the microteaching subjects received one-to-one discussion with their supervisors on the nature and practice of a particular teaching skill during every feedback session. That we can entertain the possibility that likely differences between groups may be attributable to microteaching, plus an increase in direct contact hours with trainee supervisors, is enough to indicate that a tighter control of experimental design is needed before meaningful interpretation can take place.

2.20. As mentioned, Kallenbach and Gall attempted to replicate the Allen and Fortune study, but incorporated several changes in the experimental design.

(a) The Kallenbach and Gall study assessed microteaching in both a microteaching situation and an actual classroom situation, whereas Allen and Fortune (1966) only examined post-training performance in a microteaching situation.

(b) The Kallenbach and Gall study included an element of longitudinality by assessing each subjects' beginning performance and then their subsequent performance during the first year of teaching (the intern year). This was not included in the Allen and Fortune study.

(c) Whereas Allen and Fortune used the Teacher Demonstration Rating (TDR) form, Kallenbach and Gall used STCAG, a revised development of TDR and IOTA.

(d) Subjects in the Kallenbach and Gall study differed from those in the Allen and Fortune study, in that:

  (i) they were training to be elementary teachers, not secondary teachers, as in the Allen and Fortune study;

  (ii) they were not subject to a rigorous entry procedure into the training institution, as were the Stanford interns.

(e) Grade levels of the pupils used in the Kallenbach and Gall study were of elementary school level, while those of the Allen and Fortune study were of secondary level.

2.21. On these points one could reasonably argue that in fact no replication of the Allen and Fortune study actually took place. In fact, a study similar, but different on enough important aspects, took place which found no significant difference in terms of the criteria variable between control and experimental groups.

2.22. In another study reported by Limbacher (1971), 25 interns were put through a laboratory programme involving the use of microteaching. The criteria of success was pupil evaluation as measured on the Teacher Performance Appraisal Scale, an early edition of the Stanford Teacher Competence Appraisal Guide, as well as a videotape assessment using the Flanders technique for analysis. The reported study does not indicate the skills taught during the microteaching laboratory but, as the primary goal of each microteaching lesson was to increase the awareness of the intern toward the impact of the lesson that was being presented, it is assumed that the laboratory was teaching the general skills rather than the more specific skills. The control group received methods instruction as well as intensive practice in the use of classroom technique. According to Limbacher, the major finding of the programme was that the experimental group received significantly higher pupil evaluation of a specific lesson and of their total teaching experience. However, the hypothesis that the experimental group would be judged by their co-operating teachers to be ready earlier to assume full responsibility for class instruction was not supported, and neither was the hypothesis that the experimental group would have a higher indirect-direct ratio as revealed by a Flanders interaction analysis.

2.23. Limbacher's assertion of a *"major finding of significant difference in the pupil evaluations of the two groups"* should be treated with caution. Limbacher's article gives the impression that the evaluation instrument (the 10-item TPAS), is the same instrument that was used in laboratory microteaching sessions by the pupils to give feedback to the trainees (p. 2). If this is the case, the legitimacy of using the TPAS as the criterion measure is doubtful. As the laboratory microteaching group would be familiar with the construction of the TPAS, and had presumably received feedback on the TPAS and adjusted behaviour on microteaching based on these comments, while the control group had no familiarity with the scale and had not practised and received feedback on the scale, it could be argued that by using the TPAS, a self-fulfilling hypothesis is created. Obviously the experimental group would be expected to do better because they had been exposed to the content and structure of the criterion instrument prior to the field test.

2.24. In relation to the overall structure and reporting of the experiment, other questions such as the method of allocation of trainees to experimental or control group, the assignment of trainees to schools during the field test, and a description of schools, pupils and teachers used during the experiment are not provided. As pupil evaluations using TPAS provide the measure for determining the validity of their Hypotheses I and II, and as teachers in the schools provide the evaluation for Hypothesis III, a clear statement and description of schools, pupils and teachers used would appear to be necessary. To assume homogeneity of these factors is perhaps being unrealistic.

2.25. While outwardly providing evidence for the superiority of training teachers using a microteaching technique, Limbacher's article is fraught with many serious obstacles. Putting aside the argument of what constitutes a true control group, and the stand on reporting content and technique as separate identities, Limbacher's article fails to report sufficient detail of important design aspects of the experiment, and has used a questionable evaluative procedure in one of the two hypotheses which was supported by the data.

2.26. Unlike the two previous articles, Davis and Smoot (1969) provide a description of an experimental study which gives sufficient detail to convey to the reader the content, aims, and format of the experiment.

2.27. The experiment was carried out at the University of Texas and aimed at investigating the effects of a laboratory teaching situation (microteaching) on the verbal teaching behaviour of undergraduate secondary teacher trainees. An experimental group (N=85) which was subject to a total of four microclasses practising achievement of the tasks 'clarifying instructional objectives', and 'interacting' while the control group subjects (N=55) met in regular classes and discussed issues and problems of teaching. Subject matter covered by both control and experimental groups was in most instances different with only some topics in common.

2.28. All trainees taught a 10-minute pre-test prior to the experimental period of seven weeks, and at the end of this period taught a 10-minute 'post-test'. Feedback to the experimental group was via audiotapes and pupil and instructor comments. Peers were used as the pupils for the experimental microclasses, as well as the pre- and post-test sessions. The criterion measure used for the pre- and post-test situation was the Laboratory Observation Schedule and Record (LOSCAR), a 13-category system which also yields nine ratio scores, which specifically categorizes classroom verbal interaction.

2.29. Using adjusted group means and analysis of covariance, 17 of the 22 variables of LOSCAR were found to be statistically significant at the 5% level. Davis and Smoot concluded that teacher trainees' verbal teaching behaviours could be modified by a microteaching programme.

2.30. The preamble and concluding discussion segments of the Davis and Smoot study are valuable in that, not only do the authors give an insight into their rationale of microteaching, but follow this with a discussion on the possible weaknesses of their study and the dangers of generalizing from it. They see the microteaching technique as a flexible one, which forms an integral part of an introductory course in teaching, and that central to the rationale of the teaching laboratory is the practice of prescribed *"instructional modules and pedagogic tasks"* (p. 166).

2.31. The full Teaching Laboratory programme (as distinct from the experimental procedure reported) is spread over several semesters and provides for each trainee 10-13 microteaching sessions aimed at giving practice in five to six tasks.

2.32. Warnings relating to the generalizations made and interpretation of the results, focus attention on the use of peer groups, a possible Hawthorn Effect and the possible, but unmeasured effects of the assigned instructors to experimental and control groups. On the positive side, however, the short time period involved in changing verbal teaching behaviours, only two teach-reteach cycles (four micro-lessons), using audiotape feedback, produced a significant behavioural change.

2.33. Microteaching is often put forward as a process which uses a less threatening situation for instructing trainee teachers. Thus surprisingly few studies have taken into account the level of anxiety produced by participants in a microteaching programme. Reports on anxiety levels have mainly been based on subjective reactions to the process. For instance, a questionnaire distributed to participants in a microteaching programme in the Melbourne University Modern Language Methods Programme, revealed a high anxiety level for students.

2.34. Another series of studies has validated the use of microteaching in the teacher in-service programme. The original study to validate the mini-course programme was reported by Borg *et al.* (1969). The mini-course was developed at the Far West Laboratory for Educational Research and Development; its purpose was to assist in the in-service training of teachers, rather than the pre-service training which was the goal of the Stanford microteaching programme. Due to this difference in purpose, the Far West model differs from the Stanford model in a number of important aspects. The mini-course is designed to provide a self-contained in-service course - a 'do-it-yourself' kit for the practising teacher who wishes to check or improve on his or her techniques. The precise format of mini-course materials appears to be somewhat flexible and varied to coincide with the teaching behaviours under consideration. Prior to the 'teaching' session, the mini-course model includes many of the following stages:

(a) a clear specification of behavioural objectives for each stage;

(b) practice in the identification of the desired behaviours in sample written classroom sequences;

(c) practice in planning and writing examples of the desired behaviours in response to given stimulus materials;

(d) observation of filmed examples of the desired behaviours;

(e) preparation of materials for the teaching session.

Doubts and confusion about the effectiveness of supervisory feedback, together with the special needs of in-service education, persuaded the Far West researchers to provide self-evaluation materials which focused upon the objectives under consideration. One of the hypotheses listed in the initial evaluation study conducted in respect to mini-course 1, was that "*Student teachers taking the mini-course in conjunction with student teaching will make significantly greater changes in the teaching behaviours covered in mini-course 1 than similar subjects taking student teaching without the mini-course*".

2.35. The research was conducted across three different teacher training institutions (A, B and C). In the case of the first two institutions (A and B), the experimental groups A_1 and B_1 received the entire mini-course, while groups A_2 and B_2 received varying aspects of the mini-course. The group in the third institution (C) were considered a control group and received the regular student practice teaching. The results of the study showed a large but not significant difference in the total gain score of the experimental groups over the control group.

2.36. A further field study using 48 teachers drawn from 12 different schools were put through the mini-course programme. The course was designed to create change in 12 specific areas of teacher behaviour. The difference in teacher behaviour as measured on a pre- and post-test showed that the gain in performance was significant in nine of the skills practised.

2.37. If microteaching can be defined as an adaptable technique with a variety of formats, then its effectiveness should ideally be demonstrated over all possible arrangements of elements. The experiments that have here been cited come from the secondary and elementary levels of pre-service teacher training as well as in-service training.

2.38. Overall, a fairly acceptable spread of elements does occur over the reported studies. The teaching element of the microteaching cycles varies in length from five to 25 minutes and the skills taught vary from the very specific of the 1966 Stanford programme to the more general of the Limbacher (1971) study. The programmes illustrate varying methods of providing feedback from the use of video with or without supervisors' comments to limited use of video for only some of the microteaching cycles. The varying criteria of success used by the different studies also illustrate the range of programme objectives from attainment in the use of a specific skill such as 'reinforcement' to the improvement in overall teacher effectiveness and attitudes to teaching.

2.39. Further consideration needs to be given to the nature of the use of control groups within the microteaching research literature. Often the content of a microteaching course is not the same as that given to the control group, or the concept of teaching that lends support to the microteaching technique, that is the component skills approach to analyzing the teaching act,is not applied to the control group so that in most cases the evaluation of microteaching is not just an evaluation of the technique 'microteaching' but also an evaluation of the interaction of the microteaching technique with the component skills approach.

2.40. For a true evaluation of the effectiveness of the microteaching technique the same conceptual framework of analyzing teacher behaviour must be given to both experimental and control groups, otherwise confounding of the results will occur.

2.41. As a wider adjunct to the preceding paragraph, the authors believe that statements which claim that microteaching is superior to conventional teaching training methods, are somewhat meaningless. Microteaching as expressed by the literature is a technique to practice defined teaching techniques and behaviours, and it is not intended to be a substitute for actual classroom teaching. A control group that visits schools as teacher aides is obviously not a control that can be used to evaluate the effectiveness of the microteaching technique. In most cases (Stanford for example) microteaching is only one part of an overall teacher training course. Perhaps it is the overall course which gives microteaching its impact. A further point is that it is becoming increasingly difficult to find "conventional teacher training courses", as more and more aspects of teacher effectiveness research are being applied to teacher education programmes, such as the Flanders Interaction Category System, simulation and critical instance procedures, gaming, the practice of language and the use of non-verbal cueing, so that the comparative superiority of microteaching alone is very hard to evaluate.

2.42. Finally, difficulty as to the best method to use for judging the effect of microteaching is illustrated by the reported studies. Some have used pupil evaluation rather than the supervisor or peer evaluation favoured by others. None have used expert teacher evaluation or gain in pupil achievement, presumably the ultimate aim of an effective microteaching programme. Factors such as transfer of learning to the classroom and stability of achievement have not been taken into account. Clearcut evidence as to the most appropriate criteria is needed before doubts about experimental evidence as to microteaching's effectiveness will be more likely to be allayed.

COMPONENT SKILLS APPROACH

2.43. Flanders (1963) attributes the gulf between theory and practice in teacher training to an inability to describe teaching and establish appropriate models. A hypothesis central to microteaching is that teaching can be described in terms of component skills. These 'skills' of teaching are not necessarily discrete, but they are considered to be identifiable and, therefore, capable of independent practice. A description of the component skills concept and the evidence upon which it is based is contained in Turney, *et al.* (1973) and will not be reproduced here. The nature of the component skills developed by the Stanford School covers such things as stimulus variation, set induction, the use of silence and non-verbal cues, reinforcement fluency in asking questions, lecturing and planned repetition. At the present time there is evidence of a growing resistance to the original Stanford model which visualizes the teaching act as being divisible into 'micro skills', each capable of individual practice. This resistance is based on several assumptions inherent in the Stanford approach:

2.43.1. The component or technical skills approach assumes that skills can be identified and practised separately. However, the Chicago School[2] and the authors of this report counter-argue that this approach is too static. The contextual use of a skill is important and, in fact, often determines the successful application of that skill. In other words, the situation preceding the use of a skill determines the receptivity on the part of the pupils, and often creates the situation for the use of the particular skill whilst the feedback from pupils after the use of the skill relays information to the teacher as to whether the use of the particular technique was successful in achieving a predetermined task.

2.43.2. The component skills approach, where the practice of one skill at a time takes place, does not give the student teacher either sufficient training in identifying and selecting the most appropriate skill for the occasion or evaluating how successful his choice and use of that skill was.

2.43.3. The component or technical skills approach by not overtly stating what the relationships between skills are, appears to assume that either there is no relationship between one skill and another, or that the relationships between skills need no specific comment.

2.43.4. The component or technical skills approach encourages the practice of a skill for the sake of practising a skill. The authors of this paper take the view that a skill is used to achieve a particular educational task or objective, and that the use of the skill is merely a technique used to achieve that objective.

2.43.5. The component or technical skills approach assumes that integration of the practised skills into the trainees' teaching behaviour will intuitively take place.

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[2] The report of the Chicago School approach to the skills of teaching is contained in Pereira, P. and Guelcher, W. (1970), and a full description of the Chicago microteaching programme is found in an article by Guelcher, W., Jackson T. and Nechles, F. (1970).

2.44. The technical skills approach is useful in that it provides knowledge on particular teaching skills. However, the individual practice of these skills is perhaps too behaviouristically oriented. Consequently, a more dynamic approach to content usage in microteaching programmes is emerging in the microteaching literature. Emmer and Miller (1970) use the microteaching practice technique in conjunction with a strategy approach to analyzing and practising aspects of teaching, while in a later book Thomas Gregory (1972) expounds the attainment of teaching tasks, which are of a wider and more dynamic view than the technical skills approach, via practice in a microteaching situation.

FEEDBACK

2.45. While different authors and workers in the field of microteaching may well use different definitions of the term, the element of feedback is always seen as an essential part of the microteaching process. It is this element which has received a considerable amount of attention, particularly in regard to the mechanics of providing feedback that is its method of transmission to the student. It has also been this element which has led to the controversy over the role of television in microteaching.

2.46. Although there has been extensive research into the feedback element, little attention has been paid to the actual role of feedback in the microteaching cycle. Feedback can be interpreted in a number of ways, depending upon one's basic philosophy. It can be seen primarily as reinforcement with the implication of the presence of an incentive factor. Another school would use it as being purely informative in nature while, for most, feedback is seen as contributing to all three aspects of learning - informative, reinforcement and motivational (Annett, 1969).

2.47. The early studies into the feedback element of a microteaching programme stressed more the mechanics of providing feedback and appeared to give little consideration to the type of feedback being provided that is whether it is informative, reinforcing or motivational.

2.48. Acheson (1964) drew attention to the importance of a supervisor, particularly in respect to the beginning teacher. Acheson's stand was later supported by MacDonald and Allen (1967) in a number of studies into the effect of feedback on teacher performance. Using beginning teachers, they found that the self feedback condition was ineffective in changing performance and they suggested that this was possibly due to the lack of adequate cueing, and that the feedback condition might therefore be improved by introducing some cueing procedures.

2.49. B.W. Tuckman and W.F. Oliver (1968) made a comparative study of two sources of feedback taking into account teacher experience. Two hundred and eighty-six in-service teachers were given student feedback, supervisor feedback, both or none. Feedback was based on the Student Opinion Questionnaire (SOQ). Information from this questionnaire was also used to determine change in teacher behaviour. The factors studied in the analysis of variance included supervisor feedback and level of experience. Only the student feedback factor had a significant effect and no interactions reached significance. When the four groups were compared using the Duncan Multiple Range Test it was seen that student feedback, and student feedback combined with supervisory feedback, were statistically comparable. Adding supervisor feedback did not generate further change and when given alone led to negative change.

2.50. B. C. Leonard *et al.* (1971) compared the effect of added audio feedback, added audio plus video feedbacks and normal supervisory feedback alone on verbal teaching behaviour. Twelve student teachers were assigned to three experimental groups. Pre- and post-videotapes of all students teaching were coded according to the Flanders Verbal Interaction System. An Analysis of Variance showed significant gain scores in 'indirect teaching influences' and 'student talk' for the video feedback group only, although the differences in the magnitude of change between the three groups were not statistically significant.

2.51. Of the seven studies on microteaching presented to the third Annual National Vocational-Technical Teacher Education Seminar at Ohio State University in 1969, four were specifically designed to compare types of feedback: Doty (1969), Hoerner (1969), Smith (1969), Harrincoor (1969). No between group differences in improvement were found in these studies no matter what feedback was being applied. In one study a series of four experiments examined face-to-face and remote feedback with associated techniques of delay, videotaping, critique models under laboratory conditions, and peer versus high school classes under classroom conditions. The only discriminating results were that the highest satisfaction was associated with video feedback and high school pupil classes.

2.52. The only conclusion possible from these studies is that the mechanics of how feedback is provided is immaterial to the final result. Such a finding is not surprising as little concern was shown for the type of feedback being provided. Ausubel (1965) draws attention to the evidence indicating that in the case of meaningful learning completeness is an essential feature of feedback in that precise information about the error is far more effective than knowledge about the right or wrong of the performance. This implication is to be found in McKnight's (1971) summing up of J. L. Oliver's 1969 study, *"Trainees benefit more from some kind of feedback than from self-analysis"*, (p. 3).

2.53. Only a few studies have considered the effects of providing to the student varying degrees of information about their performance.

2.54. A study by Birch (1969) designed to evaluate the Guided Self Analysis Programme of teacher training and its elements of self-confrontation, behavioural coding and self-coding used 48 student teachers divided into six groups. Five of these groups received the normal Social Studies Curriculum course, here designated enquiry-orientation, which included modelling, demonstration, coding and self-coding. A no treatment control group was enrolled in a Social Issues course. Treatment consisted of combinations of the three programme factors ranging from minimum to maximum Guided Self Analysis schedules. The dependent variables were general, questioning, response, teacher talk, total talk and length of utterance, indices of interaction. Statistical procedures included a factorial univariate analysis of variance with the general index as the dependent variable, a factorial multivariate analysis of variance and least squares estimate of effects for the direction and relative size of effect of significant factors. The full G.S.A. Group, that receiving all three feedback factors, significantly out-performed all others on all interaction indices except teacher-pupil talk. Birch found that the only factor to have significant effect on teacher behaviour was self-coding although interpretations about a trend for enquiry orientation to change teacher behaviour were modified by the fact that the control group was not randomly assigned. Self-confrontation alone, or the learning and practice of a behavioural coding system was not effective unless accompanied by self-coding.

2.55. Klingstedt (1970) has provided further evidence that it is the type of feedback that is the important variable rather than the method of communication. In comparing verbal and written prompting and cueing provided by peers and a supervisor with and without the aid of video feedback, he found no significant difference between the treatment groups. It is suggested that it is the additional information provided by a tutor that is behind the conclusions reached by Allen and Ryan -

> *"For the beginning teacher, the presence of a supervisor is as integral to a microteaching lesson as the student."*
>
> (p. 65)

and by MacIntyre -

> *"At least for those Scottish students without previous experience the provision of tutors appears necessary."*

His stand would also appear to be supported by Doty (1970), who compared face-to-face supervision with remote feedback techniques and concluded that *"face-to-face conference with, or without video feedback was judged by all participants to be of value for pre- or in-service teachers."* (p. 49).

2.56. Griffiths (1972) concludes from his survey of the literature into the role of the tutor in microteaching, that the effectiveness of supervision may depend upon

(a) The way in which the other factors in the microteaching programme are organised.

(b) The level of skill competence with which students enter the microteaching programme, or the stage of training at which supervisors are involved.

(c) The expectancies of students about the ways in which supervisors should behave.

(d) The kind of critique behaviours used.

2.57. The importance of the type of feedback provided has led to studies which have considered interaction analysis techniques as tools for providing further information to assist the observer in understanding the feedback material.

2.58. J. C. Bondi (1971) in his study examined the effect of interaction analysis on the verbal behaviour of 40 randomly selected student teachers. A control group received interaction analysis training but no interaction feedback and an experimental group received both. F-tests on the Group Mean Differences showed the experimental group out-performing the control group on 13 categories of the Hough modification of the Flanders System of Interaction.

2.59. A similar study has evaluated interaction feedback for self-evaluation specifically as a means of overcoming the barrier to communication created by supervisory feedback. In a study by R. D. Traill (1971) both student teachers and their supervisors were instructed in the Berkeley modification of the Flanders system (BIAS). During practice teaching, students formed a control and an experimental group, the latter being given the analysis feedback. Results were based on the BIAS observation procedure (15 categories and three ratios), pre- and post-tests of the Teaching Situation Reaction Test (TSRT - attitude to teaching process) and the Adjective Check Test (A.C.L. - values regarding the ideal teacher). The TSRT scores showed the treatment group improving significantly as measured by t-tests. Multivariate analysis of the T^2 test on the ACL showed no significant difference had occurred. On the BIAS scores, multivariate analysis revealed a significant f-ratio and univariate tests on the categories showed 12 being significantly different. All three ratios were significant on multivariate analysis with the T^2 test. Overall, the treatment group changed significantly toward indirect teaching behaviour, even if not all students positively approved of the Interaction Analysis procedure. Supervisors became more analytical and less evaluative.

2.60. Another important question is 'How important are audio-visual aids in the feedback process?' Here, again, the literature is not clear. In a study by Scheuller, Gold and Mitzel (1962), an addition of television recordings to the supervisor conference did not significantly improve student teaching. The authors have suggested that the visual recordings may not have added enough to produce change or improvement in performance. Hiscox and Van Mondfrans (1972) compared the effect of audio and visual feedback of both verbal and psychomotor skills. Their subjects were beginning teachers and in all experimental conditions a supervisor was present. Overall, they found no significant difference in the effectiveness of audio and audio-visual tapes as forms of feedback for both verbal and psychomotor skills. However, they did find that in the skill of questioning, audiotape was superior to videotape. In the psychomotor area they found that there was no difference between the use of audio and video in the development of the use of non-verbal skills. The explanation for this is not clear. Hiscox *et al.* suggest that one would have expected videotape to be more effective in this situation, and has suggested that the lack of difference is due to an interaction of the cosmetic effect with the other factors. In summing up this study, the authors concluded *"that audiotape can easily and effectively be substituted for videotape as a form of feedback in microteaching"* (p. 11). They then qualify this statement by suggesting that for any extensive microteaching programme the two types of feedback may be alternated, depending upon whether a verbal or psychomotor skill is being learned.

2.61. The conflicting results so far found in regard to the effectiveness of feedback may well be due to a failure to consider the interaction of this component with other components of the microteaching cycle and to ignore the work on feedback and in particular Ausubel's stand when he concludes, *"Knowledge of results is not generally indispensable for learning but, on both motivational-reinforcement and cognitive grounds, should facilitate the learning process, more so in the case of rote than of meaningful learning."* (p.319).

MODELLING

2.62. While the above studies have been concerned with only the feedback component of the microteaching technique, a few studies have attempted to consider the interaction effect of the various components, in particular the interaction between the preparation component and the feedback component.

2.63. Cueing is one element which can be used in conjunction with both feedback and modelling[3]. It can focus student attention on specific skills in the model's or his own performance. In McDonald and Allen's (1967) study the interaction effects of modelling and feedback were considered. The concluded that the 'weakest' treatment consisted in a symbolic model with non-cued feedback and that a perceptual model, associated with supervisor feedback augmented with audiotape, was the most powerful condition. They did, however, find it necessary to add a qualification to this finding.

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[3] Modelling - A process in which the student observes a model of the task or skill to be learnt. The model may be symbolic, that is consist of a written/a spoken description of the desired behaviour or perceptual in which the task or skill is portrayed either "live" or mediated by film or videotape.

> *"Such a treatment might be demonstrated to be highly effective when the behaviour being learned is not easily cued by simple instructions."*
>
> (p. 151).

2.64. One study is of particular interest here in regard to the question of the value of cueing in a microteaching programme. K.E. Claus (1969) hypothesied that cueing by supervisors during modelling and feedback sessions would enhance the component skill of higher-order questioning. The results confirmed her hypothesis and she concluded that in the acquisition of a complex teaching skill, observation learning with cueing is more effective than feedback with or without cueing.

2.65. McDonald and Allen (1967) have provided a paradigm for research in this area and also considered at length the evidence for modelling. Further reviews by McKnight (1971) and Turney *et al.* (1973) support the effectiveness and the importance of modelling in the preparation phase.

2.66. It is in this area of modelling and feedback that the videotape recorder has become so important. Videotape has been seen as an addition that can widen the scope of a microteaching programme. However, a warning note is struck by Cyphert and Andrews (1967). They make a plea to place the hardware of teacher education in its proper perspective. They have listed uses for video recording and argue that such wide use of the equipment has outstripped evaluation and that enthusiasm for the new medium has not been totally justified by research based on poor design. They propose that the initial use of videotape could be more fruitfully replaced by an analysis of the needs of particular teaching programmes, and they tentatively put one forward. The seven dichotomous approaches to videotaping which they list, illustrate the complexity of the situation. They recommend research into the economic and content aspects of education in order to increase the effective use of this valuable equipment.

2.67. Leonard (1971) feels that often the over-emphasis on videotape equipment has not been substantiated by the verbal nature of skills most often taught, and that audio equipment can sometimes be used as a substitute system.

SUMMARY

2.68. There have been claims that microteaching is a most powerful technique, and certainly its appearance on the teacher education scene has produced a flood of research into practice teaching such as has never occurred previously. While the literature would support the claim that it is an effective technique for changing behaviour, the degree of its power must be based solely upon an individual's value judgment resulting from his own experience with the technique. Its initial appearance on the teacher education scene saw it greeted as the panacea for all the ills of teaching practice but, like other teaching techniques, it has become to be accepted as a technique with a specific role to play in teacher education in conjunction with teaching practice.

2.69. It was certainly never intended to be a substitute for teaching practice and, just as the effectiveness of microteaching must be related to its inter-relationship with other course components, so do the elements of a microteaching programme need to be seen in inter-relation with each other. Research into the structure and content of individual components of microteaching has produced no significant results. For example, modelling and feedback are useful learning concepts but their effectiveness is in relation to the total programme, and so the research findings relating to either concept in isolation have produced little substantive evidence as to their relative importance or their relation to the efficiency of the total microteaching technique.

2.70. Microteaching initially appeared on the teacher education scene as a technique for changing student teacher behaviour. The criteria of success was student teacher attainment and a number of rating scales was developed to measure this attainment. Some of these scales attempted to measure such things as type of questions used, number of student responses, amount of teacher talk, quality of teacher talk. Other criteria have been changes in student attitude approach, speech patterns, anxiety, self-confidence levels, satisfaction, mannerisms or self-perception. Later studies used interaction analysis techniques such as Flanders system. A third generation of research has produced more attention to the pupils' thoughts and needs rather than concentrating on the teacher-pupil interaction process. At the Stanford Centre for Research and Development, the programme on Teaching Effectiveness is paying more attention to the cyclical aspect of teaching whereby skills can be integrated into the total teaching task (Snow, 1972). They believe that the classical microteaching model falls short in three important aspects of teacher training:

> *"First, the model concentrates exclusively on teacher technique and behaviours, without regard for the effects these techniques might have on the students .....*
>
> *Second, although the model permits the setting of very short-term goals, it does not prepare the intern for the important task of setting long-range objectives and devising strategies to attain them .....*
>
> *Finally, the intern is rarely, if ever, given the opportunity to teach for any extended period of time to a normal sized class."*
>
> (Weiss, 1972, p. 2).

2.71. There are many components of the microteaching cycle which lack detail, such as the number of cycles required to change behaviour, the degree of transfer from microteaching to an actual class lesson and the cost in terms of time, money and resources to implement an effective microteaching programme into a teacher education course with large student numbers.

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CHAPTER 3

EXPERIMENTAL PROGRAMME:
PLANNING, DEVELOPMENT AND IMPLEMENTATION

PROGRAMME PLANNING

3.1. The experimental programme called for a 3 x 2 x 2 factorial design requiring a sample of 72 student teachers. The technique of PERT was employed to plan out the work time required for the project as a whole and for each identified section and stage of the research investigation. Using a network chart, the "critical" activities of the project were identified, as well as those activities which had float time available.[1]

3.2. From the PERT analysis the following tasks for Hypothesis I emerged as being those which were critical in determining the progress of the project:

Activity	Start Time Days	Finish Time Days
Main Literature Survey	0	50
Develop and Test Assessment Instruments	50	90
Plan Data Analysis Procedure	90	95
Plan V.T.R. Procedures	95	98
Test Equipment and Procedures	98	108
Finalize Experimental Procedure	108	109
Experimental Programme Hypothesis I	109	139
Process Data	139	144
Analysis of Data	144	154
Total Time for Hypothesis I		154 days

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[1] The use of PERT in large scale research and development projects is a useful planning tool in terms of estimating project time schedules and resource requirements (Appendix 3-A). The application of PERT to educational research and development projects within Australia at the moment is not widespread. Its use within the reported project may serve as an example for other researchers to incorporate this technique in the drafting and planning of future educational research and development projects.

3.3. In actual practice, because of delays in obtaining certain reports from overseas, the literature survey took much longer than allowed for. This resulted in a number of decisions having to be made without due regard to the literature. The experimental programme was managed with the aid of a flow chart (Appendix 3-A).

RESOURCES AND ASSOCIATED CONSTRAINTS

3.4. When experimental programmes which call for a large number of subjects are imposed on top of an already existing administrative framework, a certain degree of compromise behaviour on the part of the experimenters is to be seen as inevitable. The reported experiment had to operate within a Diploma in Education environment, which did not make any formal allowances for scheduling such a project. Also, because of the diversity of administration within the course, pure random sampling of students from the total Diploma in Education course was not feasible. Consequently, the experimenters had to approach staff members in charge of particular areas and ask them would they be interested in committing their stream of Diploma in Education students to the experimental programme. Fortunately for the experimenters, two staff members in charge of the teaching methods area of Economics and Commercial Practices respectively, not only volunteered their students but also made their teaching staff of method tutors available. The experimental microteaching programme then became a part of the course for these two method areas.

PHYSICAL RESOURCES

3.5. Housing. The housing resources available to the researchers from 9.00 a.m. to 4.15 p.m. each day were two teaching rooms, each having an approximate floor space of five hundred square feet. These two rooms provided space for the teach session of microteaching, and meant that a dual microteaching system could be run simultaneously for the length of the designated programme. All other resource requirements were therefore geared to maintain for simultaneous use two identical microteaching facilities, each fully equipped at all times with television cameras and microphones. Two adjacent staff studies, because of their privacy, were used for the feedback element.

3.6. Feedback and Recording Equipment. For the experimental design CCTV equipment was necessary for the provision of feedback in four of the twelve experimental cells. In addition, it was necessary to ensure that each student's first and final teach session was recorded on videotape for assessment at a later date. This requirement, together with the tight scheduling of the student throughout, meant that standby equipment had to be available in order to minimize programme interruptions arising from machine failure. As the recording of teach sessions was a vital aspect of the research programme, it was considered desirable that technical staff be in attendance to operate the cameras, audio mixers and videotape recorders.

In order to meet the hardware requirements of the experiment, Monash University's Audio Visual Aids Section was hired to maintain and operate the equipment during the experimental programme. Equipment used in the two microteaching rooms was:

2 Ampex 7800 one inch VTRs
1 Pye Lynx Camera - no viewfinder
1 Ikigami Camera with viewfinder
2 Neck Microphones for student teachers
4 Stand Microphones for pupils

In addition, available standby equipment included:

3 5103 Ampex VTRs
2 IVC Cameras with viewfinders

It should be emphasized that the conditions described above were imposed upon the programme because of its experimental nature and do not necessarily reflect the true operating conditions of an actual microteaching programme. Most programmes are more flexible or can absorb a certain degree of programme interruption and electronic failure. In addition, the actual hardware equipment used is possibly not representative of the types of equipment that would be in use in most teacher training institutions today (see Turney *et al.*, 1973). At the time of the experimental programme the smaller ½" video format was not available for use. Use of either ½" or 1" video formats will affect the number of technical staff needed to operate equipment in that 1" video equipment is more complex in operational procedures and in most instances necessitates the presence of technical staff.

3.7. Human Resources. The human resources requirement, in addition to the technical staff, included the following:

3.7.1. Supervisory staff. Eight supervisors for the programme were recruited from the method tutors associated with the method areas involved in the experimental programme. Method tutors are practising school teachers with several years' experience who are seconded part-time to the University's Faculty of Education, in order to take on the responsibilities of a master teacher adviser for the student teachers intending to teach in particular subject areas. Because these tutors attended the university on a limited time basis and because of their range of responsibilities, supervision training could in no way be considered as formal and/or adequate. Supervisors met twice as a group, for approximately a total of three hours, before the microteaching project began. During the meetings the supervisors received instructions and had discussion on:

(a) The verbal feedback. This was intended to be "indirect" in Flanders' terms rather than instructing the student teachers in appropriate behaviour.

(b) The structure and aims of the project, and the component/skill/task approach.

Because of the practical limitations and scope of the experiment, no monitoring or feedback styles used by the supervisors during actual feedback sessions was allowed for. Due to further practical difficulties, it was not possible to randomly allocate supervisors to time slots, so they were timetabled into the programme when available. It was fully realised that this lack of control over supervisor allocation and feedback technique could contribute to variance in student behaviours not monitored by the experimental design.

3.7.2. Student teachers. Subjects for the experiment were randomly selected from the population of full-time student teachers with a teaching method in either Economics or Commercial Practice or both (see paragraph 3.4). All subjects were undertaking the full-time one-year Diploma in Education, after having graduated from their first degree course. The sex ratio for the experimental subjects was 45 males to 27 females.

Subjects were randomly allocated to the 12 treatment groups forming the experimental cells and randomly assigned to the time schedule for the microteaching programme. This randomisation refers to the initial starting time; the following three or five cycles took place at approximately the same time as the first session.

The integration of the programme into an ongoing teacher education course resulted in a time constraint which made it necessary for the experimental programme to coincide with the timetabling arrangements of the co-operating method areas. This meant that the programme had to take place over a predetermined time period set by outside conditions. This constraint also dictated the type of practice scheduling to be used, and resulted in the experiment being conducted on a semi-massed practice[2] basis. With this type of scheduling, students were timetabled to engage in either four or six microteaching cycles spread over four or six consecutive days, so that each student underwent one microteaching cycle per day.

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[2] The term "semi-massed practice schedule" refers to the arrangement of practice sessions over a series of consecutive days where either one or a series of skills are practised. Spaced practice schedules refers to the irregular arrangement of practice sessions over a long time period.

3.7.3. Pupils. School pupils were used in the teach session rather than peers. This decision was based on the findings from a number of studies that student teachers preferred the use of school pupils[3]. Also the use of school pupils avoided the argument of simulation[4]. For each microteaching facility in use it was decided, since the literature provides no guidance in this matter, to form the micro-class with six school pupils. Using two facilities, the reported experiment therefore needed 24 pupils per day. The programme was designed in blocks (Appendix 3-B) where, for each facility, 12 microlessons were taught in succession over a period of approximately one hour, and the 12 student teachers then received feedback over the following two-hour period. One implication of this design was that a "morning shift" and an "afternoon shift" of pupils had to occur, the 12 teach/feedback block being repeated in the afternoon. This design was considered necessary in order to minimize pupil time away from schools to one and a half hours. It was felt that schools, and in particular headmasters and parents, would be more willing to let their pupils and children participate in the programme under these conditions.

The pupils were drawn from two high schools in the local area. The schools when approached agreed to provide the pupils on the provision that -

(a) pupils were drawn from the lower and intermediate classes of each school;

(b) that transport was provided both to the university and back to school;

(c) an insurance cover for the pupils was taken out for the time period when the pupils were participating in the programme, including travel time;

(d) permission from the State education authority had been received;

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[3] A study conducted at Monash had also confirmed the findings that student teachers found that teaching to real pupils represented a more realistic situation than teaching to peers.

[4] Refer Chapter 1, paragraphs 1.10-1.15.

(e) parental approval for each child had been received (Appendix 3-C);

(f) each group of pupils was accompanied by a teacher from the school concerned.

All these conditions were met by the experimenters.

In dealing with the schools it became apparent that another factor, outside the experimental design, was emerging which could possibly affect trainee performance in microteaching. This factor was the differing age and grade groupings of pupils. The experimenters had no control over the selection of pupils to attend the microteaching programme and had to accept as given the daily variation of age and grade level that occurred between each batch of pupils. From the schools' point of view, pupils were often chosen on the basis of finding grades at particular time slots which were scheduled for free periods or had their normal teachers absent from the school during that time.

One feature which the experimenters were able to build into the schedule was that no student teacher taught the same group of pupils more than once. This offered the safeguard to the students that the repeated use of subject matter for re-teach presentations would not create a "stale" reaction on the part of the pupils to whom they were teaching. It also meant that over the 10-day programme approximately 240 pupils were needed. This need would not occur in a "normal" microteaching programme and as with timetabling provisions was a function of the experimental nature of the exercise.

3.7.4. Administrative staff. The administrative support required for drawing up timetables, liaising with methods staff and school principals, consulting with the Audio Visual Aids Section and various other tasks, was largely met by two members of the research team aided by other members of the university's Higher Education Research Unit. The actual administrative workload was prepared in such a way that no member of the supervisory team was engaged in any other complementary work related to the microteaching programme once the experimental programme was in operation. The major tasks involved in getting the experimental programme to the "go state" were basically the administration of manpower needs. Detailed timetables for student teachers and supervising staff had to be drawn up, as well as organising drivers and transport[5] for the pupils and technical staff for the operation of the feedback equipment.

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[5] Cars and drivers were drawn from the university's motor pool. In addition, buses were organised for times when university transport was unavailable.

MICROTEACHING PROGRAMME

3.8. Microteaching is a technique aimed at the development of specified skills or behaviours. As the technique is biased towards student action and participation, very often emphasis in reporting microteaching programmes is geared to the action section, i.e., the teach-feedback cycle with little attention being paid to the preparation aspect which occurs prior to that action period. The reported experiment identifies as being equally important the description of those matters associated with the preparation of students prior to the teach-feedback cycle of the programme.

3.9. Preparation Phase. The preparation of subjects was seen as falling into two distinct parts. In the first instance, the students were informed about the content component of the programme and its relationship to the concept of teaching and, secondly, they were informed about the nature of microteaching and the administrative arrangements of the programme. During a 60-minute lecture period, the student teachers who were to participate in the programme were introduced to the "component skill" concept. The point was consistently made that teacher behaviour is to a large degree influenced by pupil behaviour and reaction, so that many verbal statements coming from a teacher are made within a Question (T) - Response (P) - Reaction (T & P) framework and therefore strict specification of what is expected of students within a microlesson could add to the unreality of the situation. Hence students were instructed to concentrate on the use of the designated skill but at the same time to bear in mind the need to use the skill most appropriate to the given situation created at any one moment in the classroom. Although no perceptual models were presented to the students, they all received symbolic models in the form of a series of printed materials (Part B) which described

(a) the structure of the job teaching and the relationship between tasks, skills and skill components. This handout also gave the setting that each student was to shape his or her microlesson around, that is, to achieve the task set induction, using either questioning or demonstrating skills and their associated components;

(b) the components which made up the generalised forms of questioning, demonstrating, non-verbal behaviour, and voice and speech.

During tutorials which followed the general lecture, students had further discussions regarding the programme.

3.10. Teach-Feedback Cycle. Taking into account the administrative constraints imposed upon the programme and the tentative evidence from the Stanford School (McDonald and Allen, 1967; Cooper, 1971), that a break period between the components of the teach and feedback sessions is desirable, the teach-feedback cycle was of the following format:

(a) A cycle consisted of a teach session of five minutes'[6] duration and a feedback segment of 10 minutes' duration, with the feedback session occurring at least 50 minutes but not more than 120 minutes after the finish of the student teacher's teach session.

(b) The reteach element of the cycle would occur on each of the deemed number of consecutive days and would reflect the format of the cycle described in (a) above.

With this type of programme design a daily maximum throughput of 24 student teachers per microteaching facility occurred[7] with each student teacher completing one cycle[8].

3.11. During tutorials students were given a list of topics to choose from which would form the subject basis for their teach sessions. These topics had previously been compiled at a meeting with the teaching methods staff and the investigators of this project. Thirty topics were on the list presented to the students with each topic representing a small subject component drawn from the curriculum of high school economics, accounting and commercial practice. Students selected from this list of topics in such a way that no student within an experimental block of 12 presented the same lesson content to the microclass.

3.12. Concern over the so-called "cosmetic effect" (Allen and Ryan, 1969) resulted in the placing of a TV camera and monitor in tutorial rooms so that prior to microteaching, while students were undertaking their normal tutorial programme, they could see their own images on the monitor screen. Unfortunately, due to equipment shortages, not all of the experimental subjects were covered in this way.

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[6] Although five minutes is the most common time segment used in the reported studies there is no experimental data available which relates different skills and tasks to an optimum time segment within which to practise these skills and tasks. Stanford University, however, does report a lengthening of the teach session when more complex skills are practised.

[7] Teaching rooms were available to the experimenters on a 9.00 a.m. to 4.15 p.m. basis, thus a throughput of 24 student teachers per day was the maximum possible.

[8] With this type of intensive throughput, adequate timetabling and the minimizing of delays were critical to the programme operation.

PROGRAMME IMPLEMENTATION

3.13. Programme implementation occurred over a 10-working-day period (14 to 27 March), which covered the second, third and fourth weeks of the Diploma in Education year (Appendix 3-D). The first practice teaching rounds for 1972 were scheduled to take place over weeks six, seven and eight of the Diploma in Education year.

3.14. The block nature of the programme required a smooth, continuous student input at five-minute intervals during the "teaching" block, and 10-minute intervals during the feedback block. This meant that the students had to excuse themselves from other lectures and tutorials when their allotted teach session or feedback time approached. Faculty staff members had prior knowledge that students might leave lectures or tutorials to attend the microteaching programme and were subsequently not troubled by the sight of one or two students quietly disappearing from lectures. However, the programme was scheduled in such a way that, even if students had to leave lectures and tutorials to attend the microteaching programme, the maximum time that they would be away would be 15 minutes for a feedback session, or 10 minutes for a teach session.

3.15. Some scheduling delays occurred, due mainly to technical breakdown in the VTR units, but these were smoothed out during the latter stages of the project. On one occasion pupils' arrival time from one of the schools was delayed and this was the only time that a serious disruption occurred to the planned timetable. By using standby schools provision was made for covering possible disruption.

3.16. Although students occasionally missed a teach session, this was caught up somewhere within the programme so that, out of a total of 72 subjects, there were only three who failed to finish their designated programme. In addition, two subjects' last teach sessions were mistakenly erased from the videotape. However, this loss of five subjects from the experimental design did not significantly affect the analysis of data as they were spread over the experimental treatments in such a way that only one subject was missing from any experimental cell.

3.17. From the technical staff point of view, overtime had to be worked each morning in order to set up the equipment in a "go" condition for the first trainee microteach at 9.00 a.m. A pack-up and close-down period at night was necessary because of the use of the teaching rooms for evening lectures.

3.18. The detailed planning as described in the above paragraphs was necessary to ensure that the experimental programme progressed without hindrance. When microteaching is implemented as part of a normal training programme such precise planning may not be necessary.

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McDONALD, F. J. and ALLEN, D. W. (1967). "Training Effects of Feedback and Modelling Procedures on Teacher Performance", *Technical Report No. 3.* Stanford Centre for Research and Development in Teaching.

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APPENDIX 3-A

CRITICAL PATH* FOR HYPOTHESIS I

I	J	Description	Duration (Working Days)	Earliest		Latest		Float		CR. OP.	
				Start Time	Finish Time	Start Time	Finish Time	Total	Free		
0	1	Main literature survey	50	0	50	0	50	0	0	x	
0	2	State criteria (H1)	2	0	2	48	50	48	0		
0	5	Take delivery of equipment	90	0	90	5	95	5	5		
0	13	Dummy	0	0	0	97	97	97	21		
0	24	Dummy	0	0	0	64	64	64	0		
0	30	Dummy	0	0	0	116	116	116	0		
1	3	Develop and test assessment instruments	40	50	90	50	90	0	0	x	
1	5	Draft research design	5	50	55	90	95	40	40		
2	1	Dummy	0	2	2	50	50	48	48		
3	4	Plan data gathering procedure	3	90	93	92	95	2	0		
3	5	Plan data analysis procedure	5	90	95	90	95	0	0	x	
4	5	Dummy	0	93	93	95	95	2	2		
5	6	Finalize research design	1	95	96	97	98	2	0		
5	7	Plan V.T.R.procedure	3	95	98	95	98	0	0	x	
5	8	Select sample	2	95	97	106	108	11	11		
5	9	Prepare experimental timetable	2	95	97	107	109	12	12		
6	7	Dummy	0	96	96	98	98	2	2		
7	8	Test equipment and procedures	10	98	108	98	108	0	0	x	
8	9	Finalize experimental procedure	1	108	109	108	109	0	0	x	
9	10	Experimental Programme Hyp. I	30	109	139	109	139	0	0	x	Experimental Prog. Hyp. I
10	11	Process data	5	139	144	139	144	0	0	x	
11	12	Analysis of data	10	144	154	144	154	0	0	x	End Hypothesis I

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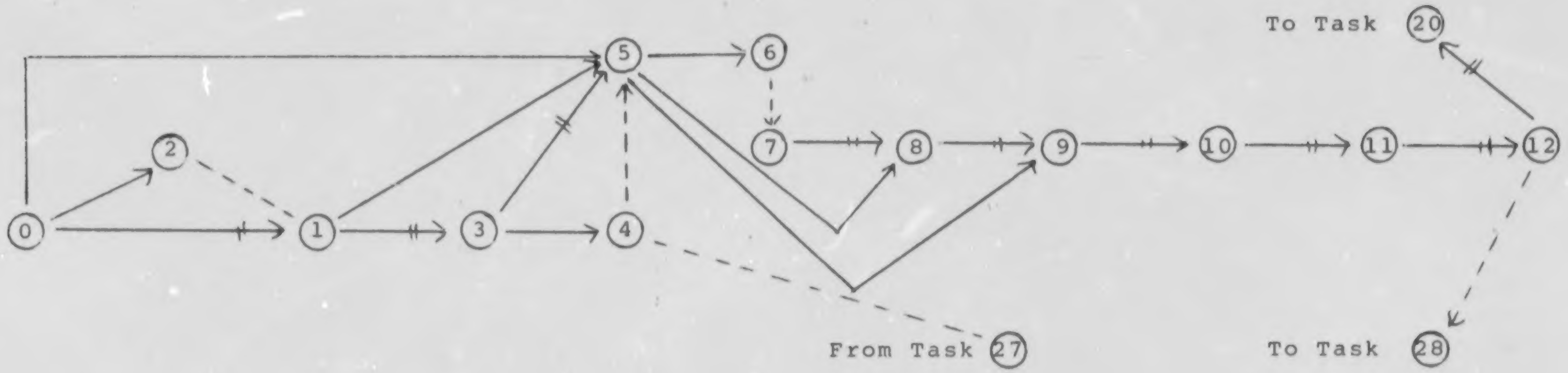
* For a discussion of Critical path technique see Lu, F.P.S. The Critical Path Method of Construction Management Coston Press, 1964.

APPENDIX 3-A

(Page 2)

ARROW DIAGRAM OF TASKS FOR HYPOTHESIS I


0
1
2
3
4
5
6
7
8
9
10
11
12
To Task 20
From Task 27
To Task 28

APPENDIX 3-B

A TYPICAL DAILY SCHEDULE FOR ONE MICROTEACHING FACILITY
(FIVE-MINUTE MICROTEACH: 10-MINUTE FEEDBACK)

8.15 a.m. Start. Set up facility		
9.00 a.m. Start microteaching	Trainee 1	Microteach
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
10.00 a.m. Finish microteach Commence feedback	Trainee 1	Feedback
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
12.00 noon Finish feedback		1. Lunch break. 2. Time out for machine maintenance 3. Changeover of supervisor
1.00 p.m. Start microteach for afternoon group	Trainee 13	Microteach
	14	
	15	
	16	
	17	
	18	
	19	
	20	
	21	
	22	
	23	
	24	
2.00 p.m. Finish microteach. Commence feedback	Trainee 13	Feedback
	14	
	15	
	16	
	17	
	18	
	19	
	20	
	21	
	22	
	23	
	24	
4.00 p.m. Finish feedback.		
4.15 p.m. Close down facility so that the room is available for evening lectures.		

APPENDIX 3-C

HIGHER EDUCATION RESEARCH UNIT
MONASH UNIVERSITY

Dear Parent,

The Higher Education Research Unit (HERU) of Monash University is currently engaged in investigating a new technique for teacher training, called microteaching. The Commonwealth Government, through the Australian Advisory Committee on Research and Development in Education, is funding the work that HERU is doing in this field.

Microteaching is a teacher training technique based on scaled down classrooms (five pupils per class) and scaled down lesson time, and the provision of feedback to the teacher via closed circuit television.

In order to establish that this technique improves the performance of teachers, we need school pupils to form classes for our teachers to teach to. The Principal has given HERU permission to ask pupils and their parents to participate in this project.

Each student who volunteers would be required to attend Monash University for approximately one and a half hours for one day only, and to participate in a classroom which will be set up in the University. The task required of students will be to take part in a classroom just as they do at school, but with different teachers giving the lesson.

Transport to and from the University will be by official University cars, with University officials and a teacher present at all times. All pupils are covered by a University insurance policy.

If you would like your child/children to participate in this programme, could you please fill out the form below and return it tomorrow.

J. I. MALLEY,
Higher Education Research Unit,
Monash University.

Consent Form 1972,
Faculty of Education, Monash University.

I consent to my child being taken from school to Monash University to participate in a microteaching programme.

The child will not be absent from school for more than 1½ hours during this school year. Transport will be provided by Monash University and the child will be in charge of a representative of the University during the journey and visit.

Signed .... Address ....
(Parent/Guardian) ....

'Phone number during school hours ....

TIMETABLE FOR EXPERIMENTAL PROGRAMME

Dip. Ed.:	Economics
Pupils:	Westall High School; Syndal High School
Transport:	Monash car
Staff:	Administration - Jeff Malley. Technical - AVA staff.
Equipment:	AVA and HERU
Rooms:	Education Faculty 220) 211) Teach rooms 210) 216) Feedback rooms

		Room No.	a.m.		p.m.	
			Record	Replay	Record	Replay
March						
14	Tuesday	220	9-10	10-12	1-2	2-4
		211	9-10	10-12	1-2	2-4
15	Wednesday	220	9-10	10-12	1-2	2-4
		211	9-10	10-12	1-2	2-4
[illegible]6	Thursday	220	9-10	10-12	1-2	2-4
		211	9-10	10-12	1-2	2-4
17	Friday	220	9-10	10-12	1-2	2-4
		211	9-10	10-12	1-2	2-4
20	Monday	220	9-10	10-12	1-2	2-4
		211	9-10	10-12	1-2	2-4
21	Tuesday	220	9-10	10-12	1-2	2-4
		211	9-10	10-12	1-2	2-4
22	Wednesday	220	9-10.05	10.05-12.30	None required	
		211	9-10	10-11.30	None required	
23	Thursday	220	9-10.05	10.05-12.30	None required	
		211	9-10	10-11.30	None required	
24	Friday	220	9-9.45	10-11.15	None required	
		211	9-9.45	10-11.15	None required	
27	Monday	220	9-9.45	10-11.15	12-1	1-3
		211	9-9.45	10-11.15	12-1	1-3
28	Tuesday	220			12-1	1-3
		211			12-1	1-3
29	Wednesday	220			12-1	1-3
		211			12-1	1-3
30	Thursday	220			12-1	1-3
		211			12-1	1-3
			EASTER			
April						
5	Wednesday	220			12-1	1-3
		211			12-1	1-3
6	Thursday	220			12-1	1-3
		211			12-1	1-3
7	Friday	220	9-10	10-12	12-1	1-3
		211	9-10	10-12	12-1	1-3

[illegible]0 Monday Teaching rounds commenced

CHAPTER 4

EXPERIMENTAL PROGRAMME: DESIGN AND DATA ANALYSIS

EXPERIMENTAL DESIGN

4.1. The research programme was based on the assumption that microteaching had been shown to be an effective technique for the development of skills in student teachers. This assumption makes no statement as to the efficiency of the technique nor does it consider the relative value of microteaching as compared to other techniques for the achievement of similar objectives.

4.2. For the first stage of the project two objectives were set:

(a) To devise the most effective method of using the microteaching technique in the pre-service education of teachers.

(b) To calculate the cost-effectiveness of the microteaching technique when used in the pre-service education of teachers.

From these two objectives four null hypotheses were stated:

Hypothesis I — In the use of microteaching for the development of teaching skills there is no optimum situation in terms of -

(a) skill to be learnt

(b) number of microteaching cycles[1]

(c) method of feedback.

Hypothesis II — Increasing class size throughout a microteaching programme does not facilitate transfer of the teaching skill to the operational situation.

If I and II rejected, then -

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[1] A microteaching cycle is defined as a teach session followed by a feedback session.

Hypothesis III Given the optimum microteaching situation for the pre-service education of teachers, the cost per student is not an economic proposition when compared with the microteaching formats.

Hypothesis IV There is no general microteaching model with a satisfactory cost-effectiveness ratio which meets the requirement of developing teaching skills in student teachers.

4.3. The literature survey report in Chapter 2 resulted in the identification of a number of variables which could be considered as providing a source of variance in any experimental design studying the microteaching technique. However, if all these variables were to be considered, the resulting design would have been beyond the resources available. It was therefore decided to select, as experimental variables, those components of a microteaching programme that appeared to produce the greatest range of cost in terms of time and resources. The components finally selected related to -

(a) skill to be practised

(b) mode of feedback

(c) number of microteaching cycles per skill

Such factors as time between practice and feedback, presence of a supervisor during feedback, pre-practice preparation, the use of real pupils and length of teaching sessions were held constant. This does not in any way reflect on the current state of knowledge as the literature is just as inconclusive in regard to these components as it is in regard to those selected as the experimental variables.

4.4. As discussed above (paragraph 4.2), the main hypothesis to be tested in Stage 1 of the project concerned the effects of the form of feedback, number of cycles and skill on the students' performance in introducing a lesson. The experimental design gave rise to a 3 x 2 x 2 factorial design (Table 4.1). With a sample size of 72 students, it was possible to sample each of the 12 cells. The alternative of sampling only half the cells using balanced sets would have increased the degrees of freedom but would have failed to provide any means of testing the existence of some interaction effects. As prior knowledge on interaction effects was not substantial, it was decided to use all observations on each combination of skills, method of feedback and number of cycles.[2] The criterion used to test the above design was deemed to be a summed score for each student on a battery of independently rated items on a number of scales, each scale reflecting some dimension of the skill being practised. Further discussion of the criteria is contained in paragraphs 4.8-4.10.

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[2] Insofar as many students did not distinguish the skills of questioning and demonstrating, it could be argued that there were in effect only six cells sampled. But the current design enabled the testing of whether the skills of demonstration and questioning, however poorly distinguished by the students, influenced the effectiveness of microteaching.

TABLE 4.1

Experimental Design

	b1			b2		
	c1	c2	c3	c1	c2	c3
a1	abc111	abc112	abc113	abc121	abc122	abc123
a2	abc211	abc212	abc213	abc221	abc222	abc223

Equal cell frequencies with n = 6 subjects per cell.
N = 6 x 12 = 72 to be drawn from the 1972 intake of Diploma in Education students.

Key to Experimental Design

a = the number of cycles per skill
a1 = 4 cycles
a2 = 6 cycles
b = the skill to be learnt
b1 = questioning
b2 = demonstrating
c = method of feedback
c1 = Video/Audio/Supervisor
c2 = Audio/Supervisor
c3 = Supervisor

EXPERIMENTAL VARIABLES

4.5. Number of cycles per skill. The available research literature provides no conclusive evidence as to the number of microteaching cycles a student teacher must undergo in order to gain competence in a set "skill". The choice of four cycles (a1) was made on the basis that this number of cycles appeared to be the most common in use for the practice of one set task. By selecting four cycles, the requirement of Cooper and Allen (1971) in regard to "overlearning" is also thought to be met. The choice of four cycles, therefore, was not experimentally based, but was based rather on common usage. A six-cycle programme (a2) was then chosen to test if an extra two cycles, i.e., 50% increase of practice, would result in either some significant gain or loss in performance. A student teacher's performance was measured on the first and final session rather than before and after these sessions.

4.6. Mode of feedback. As stated in Chapter 2, research has failed to show a significant difference in the effect of feedback due to different modes of presentation. The use of visual feedback dates back to Acheson's early study (1964) and since then there has been a consistent emphasis upon the value of television. However, Davis and Smoot (1969) showed the value of audio aided feedback, while numerous authors, as indicated in the literature survey, have drawn attention to the desirability of the presence of a supervisor during the feedback session, particularly when the subjects are inexperienced student teachers (paragraph 2.55). In the light of this evidence the feedback modes for the design were -

(a) feedback from a supervisor

(b) feedback from a supervisor aided by audiotape replay (ATR)

(c) feedback from a supervisor aided by audio/video (videotape) (VTR) replay.

For this experiment, because of its concern with a cost-effectiveness evaluation, attention focussed upon the vehicles of feedback transmission - hence the separate issue of styles of feedback, such as the use of cueing, positive reinforcement and paced feedback, were not considered.

4.7. Skill to be practised. More explicit explanations of the viewpoint adopted by the researchers towards the microteaching concept of skills and the concept used within the reported programme are contained in Chapter 2, paragraphs 2.43-2.44, and Chapter 10 of this report. In developing the input content[3] for the reported study a schema relating duties, tasks, skills and elements[4] was prepared. Already identified "skills" appearing in the literature were analysed and then reclassified within the hierarchical scheme as either duties, tasks, skills or elements of skills. This analysis did not succeed in providing a classification with complete and sharp distinctions between activities, but did provide a logical framework upon which to develop the microteaching programme content. The set task for this experimental study was that of set induction. Within this frame of reference the student teachers were required to practise either the skill of questioning or demonstrating. A questioning or demonstrating skill involved the use of a number of elements which the student teacher was told to select and use what they considered to be the most appropriate element for that particular teaching situation. This approach allowed the 'demonstrator' to ask questions and the 'questioner' to use non-verbal cues where appropriate, although emphasis during the microlesson was to be given to practising the designated skill.

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[3] A full description of the development of the microteaching content is contained in Chapter 10, Development of the Measuring Instrument.

[4] During a normal school year teachers have a number of duties to perform; one such duty is the teaching of specified subjects to particular grade levels. This most fundamental duty - the daily lesson - can be analyzed into a number of tasks which provide a logical framework on which to structure the presentation. Such tasks would include set induction, reinforcement of previously learnt material, facilitation of the learning of new material, etc. Associated with these tasks is a number of sub-tasks which would include activities such as creating student involvement, creating attitudes, causing students to use higher cognitive thought processes, etc. In order to achieve the completion of a task or sub-task the teacher utilizes a range of skills which are deemed appropriate to the task in hand. Examples of such skills and techniques would include questioning skills, demonstrating skills and a further analysis of those skills would produce components or elements, e.g., questioning involves a number of elements including listening, use of verbal and non-verbal cues, use of different levels of questions.

CRITERION OF ATTAINMENT

4.8. Closely related to the selection of skills to be practised was the development of appropriate rating scales. For each skill a list of behavioural objectives was prepared and, from these, learning outcomes were stated. As already indicated in paragraph 4.7, the final design provided for the student to practise the skills of questioning and demonstrating within a set induction framework.

4.9. Using the prepared outcomes for each of the skills of questioning and demonstrating, a list of descriptive rating items was drawn up by reference to the literature and by a process of "brain-storming". A discarding and clarification process of items that were contained within these groups then took place. Items that were similar were consolidated and ambiguous items were rewritten or deleted. These items were then grouped into four subscales, three of which reflected verbal skills and one non-verbal skills. A final subgroup, Gestalt Whole, was then added to cater for the large number of unidentified elements that could contribute to the assessment of good questioning or demonstrating. As a result of the above procedure, five subscales were developed to form the initial evaluation instrument:

(1) Verbal general
(2) Verbal specific
(3) Non-verbal
(4) Voice and speech
(5) Gestalt whole

A different rater was assigned to each scale and practice rating sessions were conducted. Pre-recorded first and final microteaching sessions were selected at random and edited on to a rating tape. Each session on this tape was then assessed by the rater.

4.10. The purpose of the rating scales was to measure performance of the task of set induction. To test the validity of the scales for this purpose, the student teacher's first and final session scores on the five subscales (and their 27 items) were subjected to factor analysis. This is reported in Chapter 10. From this analysis three factors emerged: the three subscales for Verbal Specific, Non-verbal and Voice and Speech. These appeared to be of roughly equal importance, and so the student teacher's score on the final teach session on these three scales was summed to provide the criterion variable for further analysis.[5] The student teacher's scores on the first teach session were summed to provide a measure of entering behaviour or initial ability.

DATA ANALYSIS

FORM OF THE ANALYSIS

4.11. The main part of the analysis was carried out with multiple regression techniques. Although multiple regression in this context is formally equivalent to analysis of covariance, it has greater flexibility and power (Cohen, 1968). It can provide estimates of the size of particular effects as well as their contribution to explained variance of the criterion variable. Multiple regression is a most useful technique in the circumstances of unequal numbers in the cells which occurred due to three student teachers missing their final teach session and the accidental erasure of the videotape of two other final teach sessions. The preference for multiple regression or analysis of covariance over analysis of variance arises because a student teacher's performance is likely to vary with his/her entering behaviour or characteristics. The inclusion of a covariate such as a measure of performance or the first teach session should help improve the estimates of the effects of the experimental variables and show how these effects vary with different types of student teacher.

4.12. The regression model. The full regression model formulated was of the form

$$(4.1) \quad Y_t = \beta_o + \beta_1 X_{1t} + \cdots + \beta_{16} X_{16t} + \mu_t$$

where Y_t is the summed score of student teacher t in the final teach session, $X_1 \cdots X_4$ are dummy variables representing the number of cycles, skill to be learnt and method of feedback (two dummies), $X_5 \cdots X_{11}$ are dummies representing the interactions between $X_1 \cdots X_4$

---

[5] The reliability of the measuring instrument also appeared to be acceptably high - see Chapter 10.

X_{12} is the score on the first teach session (covariate)

$X_{13}, \cdots, X_{16}$ represent the interaction between X_{12} and the experimental variables $X_1, \cdots, X_4$.

β_o is the constant and $\beta_1, \cdots, \beta_{11}$ the other parameters of the model indicating the amount by which a student teacher's score Y_t might be expected to change as a result of a unit change in $X_1, \cdots, X_{16}$.

For example, if X_1 changes from 0, (four cycles) to 1 (six cycles), then β_1 indicates the expected change in Y, other variables held constant.

μ_t is the error or the amount by which Y_t differs from that expected. given the values of $X_1 \cdots X_{16}$ and the parameters $\beta_1 \cdots \beta_{16}$.[6]

RESULTS

4.13. The full model and a number of models including particular variables were estimated by least squares and iterative methods. However, to begin the presentation of results the various cell means for the experimental variables (Table 4.2) and for the experimental and interaction variables (Table 4.3) are first considered.

4.13.1. In no case is a cell mean significantly different from zero on a two tailed t test. As might be expected, the cell mean for six cycles (Table 4.2) is higher than that for four cycles, but the mean for video is lower than for audio or supervision only. But, to repeat, the differences are not statistically significant.

4.13.2. The tables do not show the large and highly significant increase in average performance from 79.09 on the first teach session to 96.19 on the final session. However, such improvement in performance simply confirms what was already known (see paragraph 4.1), whereas the purpose of the research was to identify the optimum format.

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[6] A variety of methods of formulating a regression model for a factorial design experiment are discussed by Kerlinger and Pedhazur (1973). There are particular advantages of computation and interpretation of results with some formulations. The unequal numbers in the cells and the inclusion of a covariate and interactions with it suggest the present formulation as an appropriate one.

TABLE 4.2

DEVIATION OF ADJUSTED CELL MEAN FROM GRAND MEAN*
EXPERIMENTAL VARIABLES

	Feedback		
	Video	Audio	Supervisor
Deviation	-0.707	0.490	0.303
Standard error	1.45	2.14	2.03
Sample size	24	21	22

	Cycles	
	Four Cycles	Six Cycles
Deviation	-1.773	1.827
Standard error	1.26	1.67
Sample size	34	33

	Skill	
	Questioning	Demonstrating
Deviation	.917	-1.003
Standard error	1.48	1.54
Sample size	35	32

---

*The grand mean was the mean of the criterion variable 96.190. The adjusted scores were found by regressing the criterion variable on X_{12} (score on first teach session) and subtracting the resulting expected value of the criterion from its actual value.

TABLE 4.3

DEVIATION OF ADJUSTED CELL MEANS FROM GRAND MEAN*

FACTORIAL DESIGN

		Questioning			Demonstrating		
		Video	Audio	Supervision	Video	Audio	Supervision
4 Cycles	Deviation	-1.717	3.889	6.649	-2.892	-3.746	-6.090
	Standard Error	2.22	2.11	3.27	2.35	3.57	3.02
	Sample Size	6	6	6	6	5	5
6 Cycles	Deviation	-2.863	6.853	1.457	4.643	3.620	-2.304
	Standard Error	2.67	4.55	4.95	3.69	5.82	2.94
	Sample Size	6	5	6	6	5	5

*See note to Table 4.2.

4.14. Analysis with the regression model including the experimental variables $X_1 \cdots X_4$ and their interactions $X_5 \cdots X_{10}$ explains only .24 of the variance in the criterion variable, and the F ratio for the whole model is not significant. Student teachers' characteristics as measured by score on the first teach session is associated (significant at 1% level) with student teacher performance. Inclusion of this variable with the experimental variables and their interaction variable boosts the proportion of variance explained to .37, but X_{12} alone accounts for .18.[7]

4.15. Analysis of the reduction to explained variance by the exclusion of the experimental variables from the models shows that only the mode of feedback has a noticeable effect, and even that is not significant on an F test.

4.16. Inclusion of $X_{13} \cdots X_{16}$, the variables representing the interaction of the experimental variables $X_1 \cdots X_4$ with X_{12} the student teacher score on the first teach session, does yield one variable - the interaction with audio feedback, X_2, which adds significantly to explained variances in a number of models. In the full model outlined in paragraph 4.12, $R^2 = .43$; excluding the interaction with audio feedback it falls by nearly .05 to .38 and the F ratio is just about at the five per cent level. Further estimates with models including the interactions between the experimental variables showed the interaction between audio X_2 and X_{12} to add significantly to the proportion of variance explained. For example, the addition of this interaction variable to a model including only the constant, the experimental variables $X_1 \cdots X_4$ and X_{12} raises the proportion of variance explained from .23 to .29 with an F ratio for the difference of 5.27, significant at the five per cent level. In addition, the individual partial regression coefficients for the interaction variable and for the experimental variable for audio feedback are significant at the five per cent level on t tests.

$$(4.2)\quad \hat{Y}_t = \underset{(8.48)^{**}}{64.00} + \underset{(2.11)}{2.69}\, X_{1t} + \underset{(14.51)^{*}}{34.02}\, X_{2t} + \underset{(2.61)}{0.27}\, X_{3t}$$

---

[7] The coefficient for X_{12} in most models investigated is significant and about 0.3, indicating that a student teacher scoring one point more than another on the first teach session could only be expected to be .3 higher on the final session. However, this is not a particularly important finding as the nature of the rating scales tend to give greater scope for increased scores to those who score low on the first teach session.

$$\begin{array}{ccc} - 1.27\ X_{4t} & + 0.39\ X_{12t} & - 0.43\ X_{14t} \\ (2.27) & (.10)^{**} & (.19)^{*} \end{array}$$

$R^2 = 0.29$, F Ratio 4.09 with 6 and 60 degrees of freedom

$$(4.3)\quad \begin{array}{cccccc} \hat{Y}_t = & 73.82 & + 3.64\ X_{1t} & + 1.23\ X_{2t} & + 1.16\ X_{3t} & - 2.27\ X_{4t} \\ & (7.58)^{**} & (2.15) & (2.63) & (2.67) & (2.31) \end{array}$$

$$\begin{array}{c} + 0.26\ X_{12t} \\ (.09)^{**} \end{array}$$

$R^2 = 0.23$, F Ratio = 3.61 with 5 and 61 degrees of freedom

Standard error in parenthesis
*Significant at five per cent level
**Significant at one per cent level

where X_{1t} = 1 if six cycles
= 0 if four cycles

X_{2t} = 1 if audio replay
= 0 if otherwise

X_{3t} = 1 if supervisor
= 0 if otherwise

X_{4t} = 1 if demonstrating
0 if otherwise

X_{12t} = score on first teach session

X_{14t} = $X_{2t}\ X_{12t}$ (interaction of audio replay with score on first teach session)

4.17. The results in equation 4.2 can be interpreted to mean that audio feedback had a positive effect on performance for student teachers who rated low scores on the first teach session; and a negative effect for those who scored high on the first teach session. The negative interaction effect (-0.43) completely offsets the positive partial effect (34.02) when the student teacher's score on the first teaching session is just a fraction over the mean of 79.09. Hence, it is not surprising that equation 4.3, which omits the interaction with X_{12}, shows only a small and non-significant partial effect for audio replay (X_2).

4.18. The interaction for supervisor feedback and video feedback with X_{12} is not significant. We therefore are left with the result that the type of feedback on average does not have a significant effect. However, since audio replay has positive effects with below average student teachers, it is the preferred form for them; and since it has a negative effect with above average student teachers video or descriptive is preferred for those student teachers.

4.19. It may also be worth noting that a stepwise regression procedure on the variables $X_1, \cdots, X_{12}$ yielded only X_{12} and X_5 as apparently significant beyond the five per cent level. X_5 is the interaction for audio and six cycles. However X_5 is not significant in other models investigated. It is possible that by scanning a large variety of models with stepwise regression we have simply come across an outcome that occurs by chance less than one in 20 times.

DISCUSSION

4.20. The results discussed in paragraphs 4.13 to 4.19 do not give grounds for the rejection of the first null hypothesis detailed in paragraph 4.2 - *"In the use of microteaching for the development of teaching skills there is no optimum situation"*, at least as it applies to

(a) skill to be learnt,
(b) number of cycles.

The situation regarding type of feedback is less clear. While overall there appears to be no optimum method of feedback there does appear to be some advantage in using audio for the student teacher whose initial performance is below average, and supervisor or video for student teachers above average score on the first teach session.

4.21. It is not easy, however, to suggest a causal basis for these findings, for while it is possible to imagine why audio compared to video might help those who perform poorly on the first teach session, it is hard to see why it should reduce the performance of above average students compared to supervisor feedback.

4.22. The criterion variable for the analysis reported here was the summed score of student performance on three rating scales - verbal specific, non-verbal and voice and speech. This was defensible as the research was concerned with the task of set induction rather than particular scales. However, it may be interesting to carry out analysis with the separate scales as criterion variables. It may, too, be interesting to employ sex as a dummy variable, particularly in analysing video versus other forms of feedback.

4.23. However, at this stage we are left only with the tentative findings summarised in paragraphs 4.20 to 4.21.

STUDENT ATTITUDE TO THE PROGRAMME

4.24. The research design made no provision for student attitude to microteaching as a criterion of effectiveness. However, it was felt that some feedback from the students as to their reaction to the programme would be of value in the design of future microteaching programmes. A very simple questionnaire (Appendix 4A) was prepared and administered to the trainees in the week following their teaching round, which was four weeks following the microteaching programme.

4.25. Any microteaching programme includes the consideration of a number of practical matters. Decisions regarding such things as the length of the teach session and the timetabling of cycles are seldom assisted by reviews of the research literature. The opinion of participants in this work, therefore, seems to provide useful information. Questions which suggest alternatives to the experimental programme will, of necessity, encourage the respondent to indicate preferences for situations which he has not experienced (e.g., Questions 8, 9, 15-17, 21).

4.26. Perceived objective of the programme. While 48 per cent of the students indicated that the global potential of the programme was the opportunity to interact with groups of school pupils, only 27 per cent believed they were able to practise a specific teaching skill such as questioning. This general perception of the principal objective of microteaching is also reflected in the high percentage (91 per cent) who had misgivings about the value of peer teaching. A significant 34 per cent felt a peer group would be "not at all effective".

4.27. Preparation for the programme. The preliminary lecture and associated written materials were regarded by 52 per cent of the participants to be sufficient preparation for the teaching session. A further 39 per cent indicated a preference for increased instructional preparation. This latter group divided fairly evenly in nominating a lecture or, alternatively, a tutorial discussion as the appropriate format for their further preparation. Of the total group, 51 per cent indicated their positive acceptance of a demonstration film being used to introduce the teaching sessions. A further 45 per cent believed such a stimulus would be of "some value".

4.28. The Teach Session. This was seen as the most valuable aspect of a microteaching programme.

4.28.1. Although 64 per cent of the students indicated that five minutes was long enough for the teach session, there was a number of comments which would indicate that the later teach sessions should be of a longer period. This would encourage the use of variety of questions and enable errors to be recognised and corrected.

4.28.2. The opportunity to practise teaching to different levels of school pupils was found to be generally helpful (54%), although some (27%) felt a problem in achieving any required alterations to presentation or language level which seemed appropriate to the different levels.

4.28.3. The graduation of class size from five pupils initially to 15 pupils at the end of the programme was well received by (76%) those who undertook this programme.

4.28.3. Administrative decisions will often determine the time interval between teach and feedback sessions; however, in this particular situation, whilst the majority (71%) were satisfied, 24% believed the interval was over long.

4.29. Feedback. General satisfaction (97%) was indicated with the notion of feedback from the teaching session, 46% expressing a strong viewpoint, "Great value", 51% being content to describe the feedback session as being of "Some value".

4.29.1. The addition of technology to the feedback session in the form of a television or audio replay was felt to be "absolutely necessary for all sessions" by 63 per cent. A further 30 per cent suggested that such a provision was necessary for only some sessions.

4.29.2. Staff supervision was reported to be analytical, constructive and helpful, although some students (42%) experienced some distress in interpreting the different criteria adopted by different supervisors engaged in the programme. Others (25%) felt this diversity to be an advantage in offering a broader perspective of the teaching function.

4.29.3. Some conflict about the role of peers in this whole process was evident in that students (73%) indicated agreement with the value of commenting on "fellow students' efforts", yet when asked about the use of peers in their own feedback process, 36% indicated they would not appreciate peer participation at this point. A larger group (57%) was prepared to accept peers in the feedback role in association with staff involvement, although 37% again stated a preference for staff comment at all sessions.

4.30. General. Consistent with the participants' view of the objectives of a microteaching programme, a heavy majority (86%) concluded that the experience should be offered prior to a school practice, 70% believing it should be placed prior to the first school practice. Such a schedule increases pressures upon the students' commitments usually early in the academic year. Further problems arise out of delays brought about by the technological and human resources involved in the programme, and overall more than half (53%) reported difficulties associated with their other commitments, yet most (81 per cent) believed any disruptions tolerable in view of the experience and outcomes of the programme. A considerable number of students commented on the need for some form of follow-up after the first practice teaching round. This follow-up in the form of further microteaching would enable the students to refine their skill in certain tasks.

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APPENDIX 4-A

MONASH UNIVERSITY
HIGHER EDUCATION RESEARCH UNIT
MICROTEACHING QUESTIONNAIRE

NAME: ____________________

GENERAL QUESTIONS

1. How many microteaching sessions did you participate in?
   - (1) Four
   - (2) Six
   - (3) Other (if missed sessions, etc.)

   (Specify) ____________________

2. What did you gain overall from the microteaching sessions held prior to the first teaching round? (Check one or more)
   - (1) Confidence in handling groups of children
   - (2) Correction of bad habits (e.g., playing with chalk)
   - (3) Practice in a particular skill (e.g., questioning).
   - (4) Other

   (Specify) ____________________

   ____

3. Was the amount of microteaching spent on one skill (demonstrating or questioning) prior to the first teaching round -
   - (1) Too much?
   - (2) Sufficient?
   - (3) Not enough?

   COMMENTS:

THE MICROLESSON

4. Was the five-minute teaching session, for the purposes of practising a prescribed skill or task -
   - (1) Too long?
   - (2) Sufficient?
   - (3) Too short?

   COMMENTS:

5. Do you think that teaching fellow student-teachers instead of school pupils would be -

   (1) just as effective for practising skills?
   (2) nearly as effective?
   (3) not very effective?
   (4) not at all effective?

6. Was teaching to differing levels of school pupils - (check one or more)

   (1) helpful in providing a variety of teaching situations and responses?
   (2) confusing because of the changes in presentation and language that were required?
   (3) neither confusing nor helpful?
   (4) other opinions

   (Specify) ____________________

   ____

7. If a similar microteaching programme is run next week, should there be -

   (1) five pupils for every session?
   (2) five pupils at first, increasing to 15 pupils at the end?
   (3) other

   (Specify) ____________________

   ____

TIMING

8. Timing of the microteaching experience -

   (1) should be prior to the first teaching round
   (2) should be after the first teaching round
   (3) should be some experience prior to each teaching round
   (4) other

   (Specify) ____________________

   ____

   (5) does not matter when microteaching occurs.

COMMENTS:

9. Was the time between the microlesson and the feedback session -

    (1) Too short?
    (2) Adequate?
    (3) Too long?

    COMMENTS:

10. (a) The scheduling of the microteaching programme -

    (1) created problems with missing lectures and tutorials
    (2) did not create problems with lectures and tutorials

    (b) Did you think that -

    (1) it was worthwhile to attend a microteaching session instead of a lecture (or part of) or tutorials?

    (2) it was not worthwhile to miss parts of lectures and tutorials for microteaching?

11. Were delays -

    (1) a great inconvenience?
    (2) some inconvenience?
    (3) little or no inconvenience?

    COMMENTS:

TYPES OF FEEDBACK

12. What type of feedback did you have?

    (1) Television plus supervisor
    (2) Audio replay plus supervisor
    (3) Supervisor comments only

    IF"SUPERVISOR COMMENTS ONLY" OMIT QUESTIONS 13 AND 14

13. Do you think that the replay of your performance during feedback in relation to improving your next performance and analyzing your performance in the task required was -

    (1) of great value?
    (2) of some value?
    (3) of little or no value?

14. Do you think that TV/Audio replay was -

    (1) absolutely necessary for all sessions?
    (2) necessary for only some sessions (specify which sessions)?

    ____

    (3) was not at all necessary because the comments of the supervisor were adequate?
    (4) other

    (Specify) ____________________________________

    ____

GENERAL COMMENTS ON VIDEO (OR AUDIO) REPLAY

15. During microteaching sessions would you be prepared to have other students (rather than faculty staff) provide feedback?

    (1) Yes
    (2) Not sure
    (3) No

16. During microteaching would you prefer -

    (1) some sessions to be commented on by staff and some by peers?
    (2) all sessions to be commented on by staff?
    (3) all sessions to be commented on by peers?

17. Do you think you would get value from having to comment on fellow students' efforts?

    (1) Yes
    (2) No

COMMENTS:

18. Supervisory comments during feedback: (check one or more)

    (1) helped you to critically analyse each teaching performance
    (2) helped you in planning for the next teaching session
    (3) did not help you at all.

COMMENTS:

SUPERVISORS

19. Feedback from a variety of supervisors was: (check one or more)

(1) confusing because of differences in supervisors' comments on how you taught each lesson.

(2) confusing because of the differences in supervisors' comments on how to plan your next teaching session.

(3) helpful as there were no essential differences in supervisory feedback.

(4) helpful because the range of comments given gave a broader perspective on various aspects of the teaching function.

(5) helpful for other reasons: (state reasons)

____

____

(6) neither helpful nor confusing. Supervisory comments did not affect my teaching.

(7) confusing (for other reasons - state)

____

____

PREPARATION FOR MICROTEACHING

20. (a) Before the beginning of the microteaching sessions you had one lecture on questioning and demonstrating, plus handouts. Would you have preferred -

(1) more
(2) same
(3) less

instruction in the tasks and skills that you were required to practise in microlessons?

(b) If you marked more instruction, then what form of instruction do you envisage? (check one or more)

(1) more lectures
(2) tutorial discussion
(3) more handout material

COMMENTS:

21. Do you think the use of a film illustrating a demonstration of the tasks and skills that you are asked to practise would be -

(1) of great value?
(2) of some value?
(3) of little value?

COMMENTS:

CHAPTER 5

RETENTION STUDY

INTRODUCTION

5.1. Given that microteaching is an effective technique for improving student teachers' performance in a particular teaching skill a second criterion of effectiveness is the degree to which this improved performance is transferred across to the actual teaching situation. That is, if we do analyse the act of teaching into specific skills and practise these skills in isolation of the total act, will the student teacher integrate all these skills when placed in front of an actual class? Also, when the micro-class is replaced by a full class of 30 to 40 pupils, will the student teacher continue to perform at the previously achieved level? The original Stanford programme provided for three to ten students in a microteaching lesson and, as already discussed in Chapter 2, the literature provides little guide as to the optimum number of pupils required. In both the 1965 and 1966 Stanford programmes, in addition to a practice microlesson of five minutes' duration, the student teachers were required to take a micro-class of 20 to 25 minutes' duration. No specific reason is given for this increase in time, although it is suggested that some tasks require a longer teaching period. Staley (1970) set out to compare the effectiveness of increasing the size of the micro-class in a microteaching programme. Having completed the initial microteaching programme the student teachers were required to teach a microlesson to a class of increased size. The results showed no significant difference in attainment or attitude with varying numbers of cycles or varying class size. He concluded that there was a need for further study to assess the effectiveness of microteaching formats making use of different sized microteaching classes and providing for different numbers of microteaching cycles. The current study attempted to extend Staley's work and not only measure the effect of increased micro-class size but to measure the degree of transfer from the microteaching task to the performance of that task as part of a normal classroom lesson.

EXPERIMENTAL DESIGN

5.2. It has been suggested that a microteaching programme, because of a reduced class size, presents a non-threat situation. Therefore, by increasing the number of pupils in the micro-class, the student teacher may be provided with an increased threat situation in which to practise the specific teaching skills.

5.3. The specific hypothesis to be tested was:

> *"Increasing class size throughout the microteaching programme does not facilitate transfer of the teaching skills to the operational situation."*

As provided for in the critical path (Appendix 5-B), the final experimental design for the testing of the above hypothesis could not be finalised until the completion of the testing of the first hypothesis, and, as a result of the first experiment, changes were made in the proposed experimental design. The apparent lack of a real distinction between questioning and demonstrating[1] led to the decision to restrict the retention design to the skill of questioning with set induction as the task. Adding weight to this decision was that more than one skill would have unnecessarily complicated the design and increased the total subjects required beyond the number available. With the acceptance of the first null hypothesis, i.e. there is no difference between the different modes of feedback, the feedback mode for this experiment was limited to supervisor and supervisor plus video as in relation to costs these are the extreme modes. The final design was a 2 x 2 factorial (Fig. 5.1.) with eight subjects per cell. All subjects taught six micro-lessons with those in cells A_{22} and B_{22} teaching their last two lessons to increasing class sizes of 15 and then 20.

FIGURE 5.1.

2 x 2 FACTORIAL DESIGN

		Class Size	
		Normal Microclass Size	Increasing Microclass Size
FEEDBACK	Supervisor + Video	A_{11}	A_{22}
	Supervisor Only	B_{11}	B_{22}

5.4. The experimental design called for four measures to be made of student attainment:

(a) at completion of the microteaching programme

(b) at the end of the set induction phase of their initial practice lesson during teaching round

(c) at the end of the set induction phase of one of their practice lessons approximately halfway through their teaching round

(d) at the end of the set induction phase of one of their practice lessons occurring towards the end of the teaching round.

---

[1] The failure of the student teachers to distinguish between the two skills is discussed in Chapter 4, para. 4.28.

5.5. To achieve this degree of measurement, it was considered necessary that school supervising teachers would have to be asked to assist by rating the students. Towards this end a rating scale was developed for use by the supervising teacher (Appendix 5A). In addition to the supervisor rating two other rating situations were used:

(a) Student rated by school supervisor and independently rated at the same time by a trained rater.

(b) Student rated by school supervisor, recorded on VTR and the replay rated by trained raters.

These additional ratings were applied to a random sample of lessons and provided a check on the reliability of the supervisor rating.

ADMINISTRATION

5.6. The experimental programme was controlled by a flow diagram (Appendix 5B). The problems of administration were similar to those described in Chapter 3 for the pre-service experiment. However, there was an additional restraint. As each subject had to be evaluated immediately upon teaching in their own practice teaching round, and then at two other points throughout their teaching round, the experimental programme had to be completed prior to the start of the teaching round, but could not be started prior to the completion of the first experimental programme. This situation provided a limited time period in which the microteaching programme could be undertaken.

RESULTS

5.7. As the actual supervising teachers were unknown until the last few days prior to the teaching round, it was impossible to implement any training system for these supervisors. To provide contact with possible supervising teachers, one of the experimental team visited each school involved, discussed the project with the headmaster and in some cases prospective supervising teachers, and provided the headmaster with an instruction sheet and a number of rating scales for use by the supervising teachers. Unfortunately, in a number of cases these scales were not distributed, or distributed to the wrong teachers, due to last-minute changes by the schools in appointing supervising teachers.

5.8. As explained in paragraph 5.5, the intention was that members of the experimental team would visit a random sample of students to carry out an independent rating. Although this worked in a few cases, due again to changes in the schools and changing times of class lessons, a number of the experimental team found that even if the student was at the designated school they arrived either too late or too early to rate the student in the required lesson.

5.9. Similar problems also beset the video recording team, and they too were unable to complete their task.

5.10. As a result of the practical difficulties associated with the administration of the evaluation programme, no results were obtained for this particular study and, therefore, an acceptance or rejection of the null hypothesis could not be made.

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APPENDIX 5-A

MONASH UNIVERSITY

5th April 1972

Dear Supervisor,

As part of a research programme sponsored by the Australian Advisory Committee for Research and Development in Education into improving the preparation of student teachers for their first teaching round, your student has undergone an intensive teacher task training programme.

During the first week of their Diploma in Education course, the students were given a description of the skill of questioning. In subsequent weeks they have had the opportunity on at least four occasions to practise this skill with a group of five pupils from Forms 3 to 5, brought in from a nearby school. The length of the lesson they taught was restricted to five minutes' duration so that they could concentrate on the single skill of questioning. At the completion of each microlesson they received comments from their method tutors about their performance. The students were encouraged to utilise these comments for improvement of their next presentation.

As an experienced teacher, you will appreciate that this learning of parts of the teaching task must be integrated into the whole. A number of different training programmes have been used and an important aspect of the project is to see which, if any, of these programmes provide a better pre-teaching round training for the student teacher.

Of the 100 students who underwent this teacher task training programme, we are anxious to follow up 40 of them into the classroom situation. This is an extremely important part of the programme as it is essential that we have information about the effectiveness of microteaching in transferring to the real situation. It is impracticable for members of the research team to visit all 40 students to observe their first series of lessons. We are therefore asking for your assistance in this most important phase of our programme.

It would be appreciated if you would be willing to assess your student on the forms provided on the first five minutes of each of his or her first five lessons. The first five minutes of the lesson has been selected since for the purpose of the training programme the students were asked to practise the skill of questioning in the context of introducing a lesson, and it is felt that if transfer is to occur it is most likely to occur when the student is introducing lessons in the classroom situation. If you could hold the completed rating form, a member of the research team will collect it from you at the completion of the teaching round.

Members of the research team and methods tutors will endeavour to visit you at least once during the first week of the first teaching round to discuss with you the student's performance and the total training programme.

We would like to stress again the importance of this assessment of the student's first series of lessons and if you have any queries you are welcome to contact me at Monash University on 544 0811, Ext. 2849.

Yours sincerely,

J. C. CLIFT,

Director,
Higher Education Research Unit

MONASH UNIVERSITY

HIGHER EDUCATION RESEARCH UNIT

STUDENT TEACHER ASSESSMENT - SCALE C

You are requested to rate the first five minutes of the student teacher's lesson by circling the appropriate number on the scale provided.

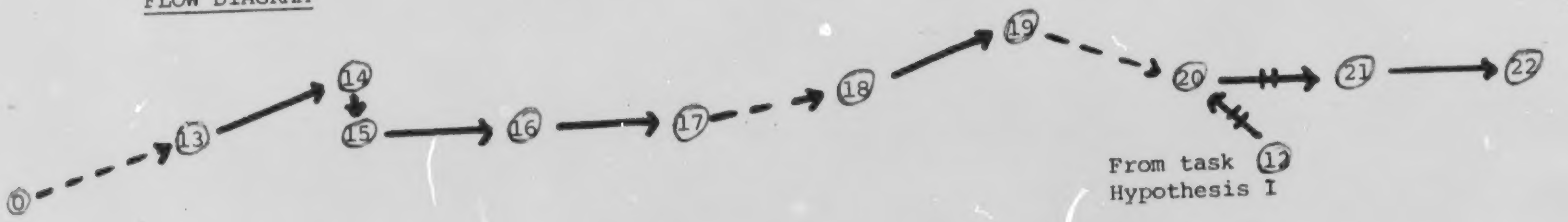
Lesson title: ______________________ Date: ______________

Item			
1.	Distinctness of voice (Is speech clean and pleasing to listen to?)	1 2 3 4 speech too casual or affected	5 6 7 speech clear and pleasing
2.	Variety of speech (Are there adequate changes of tone, pace, volume and patterns of intonation?)	1 2 3 4 speech unresponsive to situation	5 6 7 speech very responsive to situation with excellent use of pauses
3.	Time spent looking at class (Does the teacher look at the class rather than at notes, blackboard, floor or a single pupil?)	1 2 3 4 seldom 'sees' pupils in the room	5 6 7 appears to be very conscious of each pupil in the room
4.	Appropriateness of material (Is the material and language at the right level for the class and situation?)	1 2 3 4 material and language inappropriate for level of class	5 6 7 material and language very appropriate
5.	Variety of teacher questions (Does the teacher use a variety of types of questions and are they appropriate to the situation?)	1 2 3 4 type of questions inappropriate to the situation	5 6 7 type of questions always appropriate to the situation
6.	Amount of teacher talk (Does the teacher encourage pupils either verbally or non-verbally (e.g. use of facial expression or proximity to pupils) to respond to questions?)	1 2 3 4 no encouragement	5 6 7 high level of encouragement
7.	Reaction to pupil responses (Does the teacher make use of the pupils' responses to aid explanation, refocus or redirect the material?)	1 2 3 4 asks questions but makes no use of pupils' responses	5 6 7 makes excellent use of pupils' responses

CRITICAL PATH FOR HYPOTHESIS II

			Duration (Working Days)	Earliest		Latest		Float	
				Start	Finish	Start	Finish	Total	Free
12	20	Finalize research design Hyp. II	1	154	155	154	155	0	0
12	28	Dummy	0	154	154	224	224	70	0
13	14	State criteria (H2)	2	0	2	116	118	116	0
13	15	Specific literature survey	21	0	21	97	118	97	0
14	15	Dummy	0	2	2	118	118	116	19
15	16	Develop and test assessment instruments	30	21	51	118	148	97	0
15	18	Draft research design	5	21	26	148	153	127	19
16	17	Plan data gathering procedure	3	51	54	150	153	99	0
16	18	Plan data analysis procedure	5	51	56	148	153	97	49
17	18	Dummy	0	54	54	153	153	99	48
18	19	Prepare experimental timetable Hyp.II	2	56	58	153	155	97	0
18	20	Select sample Hyp II	2	56	58	153	155	97	97
19	20	Dummy	0	58	58	155	155	97	97
20	21	Experimental program Hyp. II	30	155	185	155	185	0	0
21	22	Process and analysis of data	15	185	200	229	244	44	0

FLOW DIAGRAM



From task Hypothesis I

CHAPTER 6

DEVELOPMENT OF A COST MODEL

INTRODUCTION

6.1. This chapter discusses several aspects of cost effectiveness analysis relevant to microteaching as a prelude to outlining a cost model. As discussed in Chapter 1, cost effectiveness analysis is a comparison of the costs and effectiveness of alternative ways of pursuing specific objectives. Briefly, it requires a determination of objectives for a particular programme, a list of viable alternatives for pursuing the programme, measurable criteria of performance, determination of relevant costs, and finally the gathering, analysis and interpretation of data on costs and effectiveness, (Goldman 1967, Quade 1967, Seiler 1969). Several of these stages have been considered in previous chapters, so attention in this chapter is concentrated on aspects affecting the estimation of costs and on the way decision makers should approach the cost estimates provided in Chapter 7; for cost effectiveness analysis does not provide one right solution but rather *"information which together with the judgment of the planner permits a compromise among the characteristics of the alternatives within the various environmental constraints, such as budget level or political atmosphere"* (Carpenter and Haggart, 1970, p.26).

6.2. The current study called for the costing of various microteaching formats. As there were no existing models upon which to base such a costing, it was necessary to develop a model which would meet the immediate needs and desirably be capable of modification for use in other similar situations. The model to be used was based on an educational media costing system reported by the General Learning Corporation (1968).

6.3. The determination of programme objectives is an essential prerequisite to any formal analysis of alternative strategies[1] or techniques. Where the objective of a programme is a single measurable change[2] the cost effectiveness analysis is relatively easy, but the more objectives to be achieved and particularly the more diverse the nature of these objectives, the more difficult it is to supply data on the cost effectiveness of alternative techniques for the achievement of programme objectives.[3] Fortunately, multi-objectives were not a major problem in the current study - the objective, as discussed in Chapter 4 being to assess the degree of improvement in student performance given a fixed time scale and alternative teaching techniques.

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[1] Strategies - the way in which the teacher defines the role of the student. Two main strategies are the expository approach where the teacher presents information to the student, and the inquiry approach in which the teacher arranges conditions in such a manner that students raise questions about the topic.

[2] For example, when the objective of a microteaching programme is to increase by 20% the number of high order questions asked by the teacher during a normal lesson.

DETERMINATION OF VIABLE ALTERNATIVES

6.4. As discussed in Chapter 1, alternative teaching strategies and techniques can be examined from either a fixed cost view or from a fixed effectiveness view. However, due to difficulties associated with the measurement of effectiveness, a number of writers, notably Carpenter and Haggart (1970), advocate the equal cost model in preference to the equal effectiveness model.

6.5. In the current programme, however, there is no evidence that the various formats are not equally effective (Chapter 4 para 4.23) which would suggest that some of the more costly formats could be immediately ruled out. However, because of doubt and possible disagreement about the measures of effectiveness used, there is still sufficient ground for investigating all formats, some of which may be considered on a priori grounds to be more effective.

6.6. Environmental constraints imposed upon the programme have been described in Chapter 3 (paragraph 3.4). These constraints are of importance when considering alternative systems, and provision was made in the model to count their effects.

DETERMINATION OF MEASURES OF PERFORMANCE AND CRITERIA OF EFFECTIVENESS

6.7. The criteria of effectiveness of the students' performance and the instruments used to measure this, have been considered in Chapter 4 (paragraph 4.8). However, in carrying out cost effectiveness analysis there is a need to consider the effectiveness of alternative formats at various points in time. For example, some formats may be more affected by equipment failure or more subject to obsolescence than others. The current experimental project did not provide any information on these aspects of effectiveness.[4] Nevertheless, it is necessary to discuss some of these aspects of effectiveness since they could be critical in the decision about the format of microteaching adopted. Sieler (1969) has provided a list of factors important in analysing effectiveness. From this list the following factors were derived for consideration in the current study.

(a) the availability of alternative systems

(b) the reliability of alternative systems

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[3] Refer to Blaug (1970) for a discussion of the problems of measurement associated with multi-objective programmes.

[4] All the experimental work was undertaken over a four-week period and sufficient equipment was available to ensure all formats could operate whenever required (see Chapter 3 paragraph 3.5).

(c) the survivability of hardware and software components of individual systems

(d) the ability of alternatives to meet future expansion

(e) the ability of alternatives to operate either on a period or mission concept of effectiveness

(f) the time phasing of the effectiveness arising from each alternative.

6.8. Formats involving electronic hardware are those with CCTV and ATR feedback. Within an intensive microteaching programme, machine availability and, to some extent, systems availability will be significantly affected if average repair time exceeds the average idle period for the hardware. For practical purposes, machine availability, once it is within the system, depends on the degree of technical servicing available, that is, whether the system is a non-maintained, a partially maintained, or fully maintained system. If a CCTV machine breaks down a "fully maintained" system, involving back-up equipment allows the CCTV format to continue in operation. Where back-up equipment is not available some delays will occur.[5] Of course, the experimental results in Chapter 4 do not suggest there would be any loss of effectiveness in proceeding without CCTV but this discussion is intended to be relevant to situations where electronic hardware is thought to contribute to the effectiveness of a programme.

6.9. The notion of survivability as listed by Sieler is applicable to equipment but in this case it also applies to the content of microteaching programmes and possibly to the concept of microteaching.

6.9.1. Hardware. Audio-visual equipment is often rendered obsolete in terms of design and performance within a very short space of time. For example, with the advance of video technology over the past few years, early purchasers of video equipment have been put at a distinct disadvantage in terms of what they purchased in one year and what was available in the following year.

6.9.2. Software input. The content of many microteaching programmes is based upon the identification and validation of teaching "skills" and "behaviours" which are hopefully related to some quality measure of teaching and, ipso facto, some quality or measure of pupil achievement. Although pupil achievement is not deemed to be the sole criterion of teacher effectiveness, most teachers would rank it highly as an indicator of a "good" teacher, and Rosenshine (1971) has suggested that many so-called skills or behaviours have little influence on pupil achievement. As many of the skills and behaviours used in microteaching programmes have yet to be validated, it could be hypothesized that the survivability of the input is subject to further research findings.[6]

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[5] Extra equipment might also be required if a mission concept of effectiveness - such as a minimum specified level of performance - was adopted.

6.9.3. Microteaching format. Microteaching research has so far neglected to evaluate the effectiveness of microteaching as against other possible techniques that could be used for the acquisition of skills. With the growth of other techniques (e.g., role-playing, modelling and critical incident), the microteaching format may be found to be a less efficient technique and in due course become obsolete.

6.10. If alternatives are examined in the light of their capacity to meet future demands, such as an increase in student numbers, the findings may be a sufficient discriminator in favour of a particular alternative.[7] It is also possible that the achievement of long-term objectives could be hampered by the decisions made in meeting the short-term objectives. Clearly, then, consideration of alternatives needs to include the ability to meet future expansion and long-term objectives.

DETERMINATION OF RELEVANT COSTS

6.11. The purpose of this section is to consider what items should be costed to a particular microteaching format, how these items should be costed and the factors affecting the size of these costs. A more detailed discussion of the problems of costing instruction techniques is given in Seiler (1969).

OPPORTUNITY COSTS[8]

6.12. The rule applied in determining whether any particular item involved should be included in costs is - "What are the opportunities foregone in using it?" If, for example, particular equipment already purchased would be unused if not needed for microteaching, then no cost should be attributed to it other than the (avoidable) operating costs. Items with such idle capacity can be called "inherited resources". The concepts of "inheritance" of resources becomes increasingly important as more and more innovatory programmes are considered and introduced. It is possible that from a cost point of view the inheritance factor may be the only distinguishing characteristic between alternative programmes[9]. Of course, if it is intended to replace "inherited" equipment when it wears out it must be considered in costs. Moreover the idea of inheritance does not apply when existing resources are already at peak usage.

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[6] Packaged courses such as Far West Laboratory's Mini courses and Sydney University's Skills Development Project are particularly vulnerable to this notion of content obsolescence. While their multiple component basis may give them a flexibility for modification in line with changing philosophies, if they are seen as total packages they may be rather costly and meaningless in relation to future research findings in the area of teaching effectiveness and associated teacher behaviours.

[7] In the field of CCTV it may appear economical to purchase portable back-pack units for present needs. However, future requirements may demand a CCTV system that is capable of growth in terms of its ability to integrate other pieces of equipment so that a more sophisticated system is gradually developed. This type of expansion is not possible at this time with back-pack units as the majority of these are incapable of such integration.

[8] For a useful discussion on the practical costing applications of the concepts used in this section see Bottomley (1972).

6.13. Teacher training institutions will differ in the amount of their inherited resources. This particularly applies to the cost of hardware items such as the CCTV system. In these circumstances it is not possible to provide actual cost estimates relevant to all institutions. To lessen this problem the estimates in Chapter 7 attempt to include all items which could involve opportunities foregone, even if some may have no alternative use in particular institutions. There is also an attempt to include items which, though they do not involve opportunities foregone and are thus free to the training institution, do involve costs elsewhere in society. An example is the cost of the teachers accompanying the pupils to the sessions[10].

6.14. The concept of opportunity costs is easy to understand, but its application is difficult (Bottomley 1972). Speculative statements regarding what is or will be foregone, are often all that can be made, especially in the field of teacher education. In this field of training it is next to impossible to obtain overall agreement on a ranking scheme of what should be included in a teacher training curriculum or what is considered as most desirable and valuable. Consequently, the determination of the most valuable use to which resources may otherwise be put, is never a unanimous one, and often a controversial one. Usually all that can be done for those items with alternative uses is to estimate the proportion of their annual financial cost attributable to a particular programme. Even this is a particularly difficult task when equipment is purchased for "multi-mission" purposes or when existing equipment has some slack capacity. In the light of these difficulties, the decisions made in Chapter 7 for the estimation of equipment costs attributable to CCTV feedback and the increase in such costs with student numbers should therefore be scrutinised carefully.

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[9] If CCTV/VTR systems already exist in an institution and are not being used to capacity, an alternative instructional system which uses CCTV will be preferred, say, to an instructional system to meet the same objectives which requires the installation of a complete computer system or the mass purchase of expensive teaching machines.

[10] However, it has not been possible to make any useful costing of the pupils' or the students' time, which is also free to the institution. If the introduction of MT forms only a part of an overall teacher training course, then the only costs to students are the activities that are foregone during the time period of the daily microlesson. However, where packaged MT programmes are used which require the student to purchase written materials such as work manuals, then the costs of such purchases should be reported.

OTHER COSTS

6.15. Before turning to an outline of the cost model, special comment is made on two additional aspects of costs.

6.16. Research and development. Microteaching consists of a practice technique or format and a "software" input content based on the theory of component skills of teaching. Due to the current confusing state of research relating to teacher behaviours and their relationships with learning achievement (Rosenshine, 1971) it is this content aspect which may well be overlooked by teacher education institutions. In implementing a microteaching programme there are three possible courses of action in relation to programme content:

6.16.1. Have no specific content or evaluation and have the student teachers just "teach" in the microteaching environment: this involves no cost in terms of research and development.

6.16.2. Buy a packaged programme of teaching skills which may or may not have been validated. This course of action may involve research and development if the effectiveness of the programme is to be evaluated and adjusted. These procedures are developmental so costs incurred are included as part of the research and development function.

6.16.3. Develop content specifically for the programme by implementing a continuing research and development programme relating to the identification, validation and practice of teaching behaviours. Such an action would involve, not only development costs, but also research costs.

The implementation of a research and development programme and the incurring of its associated costs is entirely up to the judgment of the programme administrator. However, it should be pointed out that, unless some formal monitoring and updating system is used, a large cost structure could be supporting for quite a long time a completely ineffective software component. Research and development costs are the largest item in the cost estimates reported in Chapter 7.

6.17. Geographical location. A number of cost savings or cost incurrence considerations will depend upon the decision as to where the microteaching programme is to be implemented. For example, suppose CCTV is to be used as the feedback vehicle and the institution has studio facilities, then certain cost savings may occur if microteaching takes place in the existing studio rather than in some ordinary teaching room elsewhere, even if this involves transporting pupils from schools. On the other hand, extra costs such as travel and equipment transportation may be incurred if it is decided that the microteaching programme is to be implemented in schools situated away from the institution. It should be borne in mind that no estimates of such costs are included in Chapter 7 where attention is confined to programmes operating within the teacher training institutions.

ORGANISING COST DATA: A COSTING MODEL

6.18. The discussion in this chapter has been mainly directed to indicating broad guidelines for the cost analysis to be undertaken, but so far we have not considered the actual methods of costing the alternative formats. This section briefly outlines the approach to estimation and presentation of costs, employed in Chapter 7, based on a cost model developed by the General Learning Corporation (1968) for costing educational media.

6.19. The cost model is based on a series of modules. Each module represents a fairly distinct aspect or function of the design and/or implementation of a format for an educational programme. Within each module some resources may be capital items such as buildings but they are costed on the basis of the proportion of their annual rental value attributable to the programme under consideration.

6.20. The use of some capital goods, and even some apparently recurrent items such as technicians' services, does not always involve a cost if there is no alternative use for them. But, as mentioned in paragraph 6.12, it is necessary to make provision for the costing of these items so that the estimates can be adapted to particular institutions with a variety of inherited or otherwise idle resources.

6.21. The various modules are outlined below, followed by a list of the microteaching formats for which cost estimates are presented in Chapter 7.

6.21.1. Enabling resources module. This provides a costing of the resources required to provide one microteaching unit which can be defined as one teach and feedback session for one student teacher. Included within this category of enabling resources are the following sub-components:

(a) Housing requirements

(b) Real pupil requirements

(c) Supporting teacher requirements

(d) Feedback facilities requirements

(e) Miscellaneous requirements such as chairs, desks, tables, etc.

Excluded from costing within this category are technical and academic staff and software such as student handouts and workbooks.

6.21.2. Operational Manpower Requirements Module. This is made up of the following sub-modules which are costed separately and then combined to provide a total manpower cost.

Supervisory staff requirements module. This provides a costing of the staff required to maintain the designed programme in a fully operational state for a specific length of time. In the microteaching situation the cost is related to the number of academics required to act in the "supervisory" role during the designed programme.

Technical staff requirements module. This module, depending on the type of equipment used, calculates the number of technical staff needed during the programme and the associated salary cost attached to the use of that labour.

6.21.3. Research and development module. This module identifies the manpower and material requirements needed for the functions of basic research, applied research and materials and programme development.

6.21.4. Administrative module. This module identifies administrative man hours spent in training support staff on school liaison, on programme timetabling, on programme design and on actual programme control and implementation when the mictroteaching cycles are under way. It also includes the cost of materials used in the administrative function.

6.21.5. Software materials module. This calculates the cost of the software inputs, such as student handbooks, used in a programme.

6.21.6. Summarization module. This module calculates the minimum time required for programme completion and from this provides estimates of overall programme costs including the cost per microteaching unit and cost per student teacher.

6.22. The modules were applied to provide cost estimates for students undergoing the following microteaching formats:

(i) 4 sessions, supervisor feedback

(ii) 6 sessions, supervisor feedback

(iii) 4 sessions, audiotape (ATR) feedback, plus supervisor

(iv) 6 sessions, audiotape (ATR) feedback, plus supervisor

(v) 4 sessions, videotape (CCTV) feedback, plus supervisor

(vi) 6 sessions, videotape (CCTV) feedback, plus supervisor

6.23. The costing for each of the six microteaching formats was on the basis of a block design microteaching programme with a student throughput of 72 for each format. In addition, for all units using CCTV or ATR supplemented feedback, alternative costing was provided on the basis of:

(i) high cost and medium cost feedback systems (Appendix 7-A)

(ii) a non-maintained, partially maintained and fully maintained system (Appendix 7-B).

6.24. The estimates of the costs for each format are reported in Chapter 7, while the detailed discussion of the costing of individual modules is left to Chapter 11.

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CHAPTER 7

COST ESTIMATES

INTRODUCTION

7.1. This chapter presents a summary and a discussion of the cost estimates which were obtained with the help of the modular cost model briefly outlined in Chapter 6. Detailed estimates and a discussion of estimating procedures are given in Chapter 11.

7.2. Cost estimates have been prepared for the three types of feedback, with both four and six cycles per student, for a group of 72 students.[1]

COST COMPARISONS

7.3. The minimum cost microteaching format was that with supervisor feedback and four sessions per student teacher. The extra costs incurred by choosing one of the other formats are shown in Table 7.1. It can be seen that ATR feedback involves costs only slightly more than supervisor feedback. For both these methods of feedback a change from four to six cycles costs a little over $8 extra per student teacher. The use of VTR involves a substantial increase in cost from a minimum of about $7 per student teacher with a medium cost non-maintained system, to about $44 per student teacher for a high cost fully maintained system with six cycles. The size of such costs may be put in context by considering them as a proportion of, say, the annual cost per student teacher of the whole teacher training programme - well over $1,000 even in 1969 (Selby Smith, 1972) - or as a proportion of the minimum total cost for a microteaching programme. It is not easy to decide which costs in a particular institution should be attributed to the microteaching programme.[2] However, for this project the total costs for the format with four sessions and supervisor feedback, for 72 student teachers, came to $6,700 or not far short of $100 per student teacher, so the highest cost format involved an increase in excess of 45 per cent over the minimum cost formats.

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[1] In fact, while the programme catered for 72 student teachers, only small numbers of student teachers (usually 12) were subject to any particular interaction of cycles and type of feedback - see Chapter 4.

[2] See paragraphs 6.12-6.17.

TABLE 7.1

COST PER STUDENT TEACHER OF VARIOUS MICROTEACHING FORMATS - EXCESS OVER MINIMUM COST FORMAT[1] 1972 $

	Supervisor		ATR[2]				VTR[2]			
	4 Cycles	6 Cycles	4 Cycles		6 Cycles		4 Cycles		6 Cycles	
			MC	HC	MC	HC	MC	HC	MC	HC
Maintenance[3]										
Non-maintained	0	8.34	.07	.13	8.47	8.53	7.17	11.57	17.83	22.31
Part maintained	-	-	.15	.21	8.56	8.64	7.96	14.04	18.43	24.57
Fully maintained	-	-	.43	.56	9.01	9.20	11.57	23.56	22.06	34.11

Notes:

1. Minimum cost, for supervisor format with four sessions (and either questioning or demonstrating), is $93 = $6717/72 (See Table 7.2). These estimates are based on 72 students undertaking the microteaching programme in the year 1972. Details of components of cost and total cost are given in Tables 7.2-7.7. Estimates for greater numbers of student teachers are provided in Tables 7.9 to 7.11. For details of cost estimation see Chapter 11.
2. For description of Medium Cost and High Cost systems see Appendix 7-A.
3. For a description of types of maintenance see Appendix 7-B.

ELEMENTS OF TOTAL COSTS OF ALTERNATIVE FORMATS

7.4. The estimates for the modules listed in paragraphs 6.21-6.21.6. for 72 student teachers for each format and with the various ATR and VTR systems are presented in Tables 7.2-7.7. The estimates are grouped under the functional headings Instruction Costs, Facility Costs, and Support Costs. The more usual breakdown into capital and recurrent costs is less useful for decision making. However, it is easily obtained from the modular costing in Chapter 11 and a summary is presented in Table 7.8.

7.5. Some comments on the estimates are necessary if their relevance to other institutions or to different numbers of student teachers is to be gauged.

SUPPORT COSTS

7.6. The largest element of costs is Research and Development. It forms over two-thirds of the minimum cost format and still nearly half the maximum cost format (Table 7.7). The cost of Research and Development is shown as the same for all formats, and is assumed to remain unchanged with increased numbers of student teachers (Tables 7.9-7.11). Therefore it has no influence on a choice between the various formats considered in this report. However, it is such a sizeable item that there is an incentive to spread Research and Development expenditure over a large number of student teachers. In one sense this would be done if the microteaching programme were an ongoing one over several years. The actual cost (shown in Tables 7.2-7.7) comprises a large part of the annual cost of a research worker and a fraction of the cost of a senior academic.[3] Such expenses could be expected to be smaller in later years of the programme leading to a lower average annual cost.

7.7. As discussed in paragraph 6.16, another way of reducing Research and Development cost is through the purchase of a package developed in some other institution. However, this may still involve considerable expenditure if the programme is to be evaluated and at all adapted to particular needs. The other alternative mentioned in paragraph 6.16 of no Research and Development expenditure is hardly defensible.

7.8. Administrative costs are considered a Support Cost and form the second largest element of cost except for formats involving the use of maintained high cost ATR feedback. The main administrative cost is the general organisation and timetabling of the programme. It is possible that timetabling problems were greater in the current project than would normally be the case because of the need to arrange sessions and student teachers to suit the experimental design. These costs are seen to vary with the number of sessions and to be slightly higher with the more complex systems of feedback. It could be hoped that greater experience in administering the programme might lead to some fall in these costs.

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[3] This relatively high expenditure on Research and Development must be seen in the light of the objectives of the current study which from its inception was primarily a research project.

7.9. School liaison costs are classified separately to call attention to an important item in the administration of a microteaching programme involving school pupils. They comprise the costs involved in approaching schools, explaining the programme and obtaining consent for pupil participation. It is seen to increase in step with the number of pupils required.

7.10. The actual cost of supervising microteaching cycles is included under Instruction Costs, but supervisor training is not directly related to the "instruction" of student teachers and so has been classified as an administrative cost. The cost of supervisor training varies directly with the number trained. In the estimates provided the same pool of supervisors is assumed to provide feedback, so all the tables show the one figure of $238.

7.11. Administrative costs are, then, a major cost element. Most of the administrative costs vary with the number of cycles. Hence, while there are few economies of scale with increased numbers of student teachers within a particular format there are lower costs for formats involving four rather than six cycles.

FACILITY COSTS

7.12. Facility costs comprise those resources that 'enable' the cycles to take place, i.e., Enabling Resources and, for VTR only, Technical Staff. What is most striking from Tables 7.2-7.7 is that for supervisor and ATR formats these costs which include nearly all the capital costs[4] are very small even with six cycles per student teacher. In contrast is the substantial Facility costs for VTR systems where they form nearly all the extra cost associated with the use of VTR (Table 7.1).

7.13. Like the Administrative costs, most of the Facility costs increase proportionately with the number of cycles. However, this assertion depends on assumptions about the use of resources when they are not engaged in the microteaching programme.

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[4] The estimation of the annual cost of capital items and the attribution of part of this cost to the microteaching programme, is discussed in Chapter 11.

7.14. The first four items of Enabling Resources - housing, pupils, their accompanying teachers and miscellaneous - are estimated to cost about 60 cents a cycle.[5] Included in these estimates was the cost of the time of school teachers necessarily accompanying their pupils to the sessions, even though in the actual experiment no charge was incurred by the Faculty of Education. No costing was made for the school pupils' time; only of their transport to and from the Faculty. This latter charge would rise if it were necessary to draw pupils from more distant schools. Supervisor feedback requires no Feedback Facilities (except of course the supervisor considered under Instruction Costs) or Technical Staff. ATR requires no Technical Staff and only quite inexpensive equipment, with a maximum cost of under 20 cents a session.

7.15. VTR feedback requires both expensive feedback equipment and, it is assumed here, someone additional to the supervisor to operate it. The microteaching cycles could not be scheduled as in the project reported here if the supervisor himself had to operate the VTR equipment. Even if he could operate it, his efficiency in criticising the lesson may well be diminished. The cost of technical staff to operate VTR equipment is estimated to be just under $1 per cycle (whatever the number of cycles) for all types of VTR systems considered here. The cost of VTR facilities for a programme for 72 student teachers varies from just over $220 for a medium cost non-maintained system for four cycles to nearly $1,400 for a high cost fully maintained system for six cycles per student teacher. The various degrees of maintenance and cost are discussed in Appendices 7A and 7B. Calculation of the costs is described in Chapter 11.

7.16. The cost of VTR Feedback Facilities is estimated by first determining the annual cost of the VTR system and then determining the proportion of that cost attributable to the microteaching programme. The estimates in this chapter are intended to help guide decisions about future purchases of VTR So it is reasonable to consider the costs of the capital investment in VTR attributable to the programme as well as running costs and maintenance. If an institution already has unused VTR which it will not replace when it wears out, or it intends to purchase VTR for prestige rather than educational reasons, it might be reasonable to confine attention just to operating costs and maintenance.[6]

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[5] From Table 7.2, Enabling Resources for supervisor feedback are $183 for 288 cycles.

[6] If, because of the current climate of educational opinion, funds are available for VTR equipment but not for other types of equipment or for items of recurrent expenditure, then it may be reasonable to ignore the cost of the VTR equipment.

7.17. VTR is likely to be purchased for other uses in addition to microteaching, such as recording the lessons of master teachers, classroom observation and the transmission of demonstrations or lectures. The assumption is made that 55 per cent of the cost of VTR equipment is attributable to microteaching. This is based on an estimate of the number of hours' use required for a tightly scheduled programme for 72 students with six sessions - about 130 hours - compared with the actual use in 1972 of VTR equipment in the Faculty of Education outside microteaching - about 108 hours. However, this also implies considerable spare capacity over the year. Unless it is essential for the microteaching programme to be taken very early in the year, the same equipment could be used to provide many more student teachers with feedback in their microteaching programme. Therefore, the effect of increasing the number of sessions from four to six is shown (Tables 7.5-7.7) to have only a small effect on costs of VTR feedback facilities.

7.18. However, in an institution in which VTR equipment was used to capacity, then each extension in its use for microteaching would mean a reduction in its availability elsewhere. In such a case, costs could be attributed to the microteaching programme in proportion to the fraction of annual capacity usage involved. The costs would be considerably lower than shown in Tables 7.2 to 7.7 although the cost for six cycles would be roughly 50 per cent higher than for four cycles (examples of the effects of different assumptions are shown in Table 7.13).

INSTRUCTION COSTS

7.19. The major instruction cost is that of the academic staff who supervise the cycles and provide feedback to the student teachers. It is costed at over $1 per cycle whatever the number of cycles. The fact that there is in effect a class size of one implies that microteaching is a relatively expensive form of instruction when compared with lectures or tutorials.

CAPITAL AND RECURRENT COSTS

7.20. As stated in paragraph 7.4, the estimates presented in Tables 7.2 to 7.7 can be rearranged under the headings of capital and recurrent costs. By capital cost is meant the annual cost of capital equipment or buildings but not their purchase or construction price. Table 7.8 summarises the estimates for the three systems of feedback (but only for medium cost equipment). It indicates, as already noted, that the major cost items for a microteaching project are recurrent costs, with the bulk of these costs being attributable to the wages of administrative, research, supervisory and technical staff. For microteaching programmes not using VTR assisted feedback, the contribution of capital cost to total programme cost is less than 1 per cent. For programmes using VTR assisted feedback the percentage contribution of capital cost is still minimal being in all cases less than 8 per cent of total cost.

TABLE 7.2

COST FOR 4 CYCLE FORMATS, NON-MAINTAINED FEEDBACK SYSTEMS

72 STUDENT TEACHERS

	Supervisor		ATR				VTR			
			MC		HC		MC		HC	
Instruction Costs										
Academic Staff Module	320		320		320		320		320	
Software Module	12		12		12		12		12	
	332	5.0%	332	4.9%	332	4.9%	332	4.6%	332	4.4%
Facility Costs										
Enabling Resources Module -										
Housing	44		44		44		44		44	
Real Pupils	17		17		17		17		17	
Teacher Support	121		121		121		121		121	
Miscellaneous	1		1		1		1		1	
Feedback Facilities	-		6		9		221		539	
Technical Staff Module	-		-		-		285		285	
	183	2.7%	189	2.8%	192	2.9%	689	9.5%	1,007	13.3%
Support Costs										
Administrative Module -										
Programme Organisation	996		996		996		1,004		1,004	
School Liaison	100		100		100		100		100	
Supervisor Training	238		238		238		238		238	
Research and Development Module	4,868		4,868		4,868		4,868		4,868	
	6,202	92.3%	6,202	92.3%	6,202	92.2%	6,212	85.9%	6,212	82.3%
TOTAL PROGRAMME COSTS	6,717	100.0%	6,723	100.0%	6,726	100.0%	7,233	100.0%	7,550	100.0%

TABLE 7.3

COST FOR 4 CYCLE FORMATS, PARTIALLY MAINTAINED FEEDBACK SYSTEMS

72 STUDENT TEACHERS

	ATR				VTR			
	MC		HC		MC		HC	
Instruction Costs								
Academic Staff Module	320		320		320		320	
Software Module	12		12		12		12	
	332	4.9%	332	4.9%	332	4.6%	332	4.3%
Facility Costs								
Enabling Resources Module -								
Housing	44		44		44		44	
Real Pupils	17		17		17		17	
Teacher Support	121		121		121		121	
Miscellaneous	1		1		1		1	
Feedback Facilities	8		12		261		698	
Technical Staff Module	-		-		285		285	
	191	2.8%	195	2.9%	729	10.0%	1,166	15.1%
Support Costs								
Administrative Module -								
Programme Organisation	999		999		1,024		1,024	
School Liaison	100		100		100		100	
Supervisor Training	238		238		238		238	
Research and Development Module	4,868		4,868		4,868		4,868	
	6,205	92.3%	6,205	92.2%	6,230	85.4%	6,230	80.6%
TOTAL PROGRAMME COSTS	6,728	100.0%	6,732	100.0%	7,290	100.0%	7,728	100.0%

TABLE 7.4

COST FOR 4 CYCLE FORMATS, FULLY MAINTAINED FEEDBACK SYSTEMS

72 STUDENT TEACHERS

	ATR				VTR			
	MC		HC		MC		HC	
Instruction Costs								
Academic Staff Module	320		320		320		320	
Software Module	12		12		12		12	
	332	4.9%	332	4.9%	332	4.4%	332	3.9%
Facility Costs								
Enabling Resources Module -								
Housing	44		44		44		44	
Real Pupils	17		17		17		17	
Teacher Support	121		121		121		121	
Miscellaneous	1		1		1		1	
Feedback Facilities	13		22		514		1,377	
Technical Staff Module	-		-		285		285	
	196	2.9%	205	3.0%	982	13.0%	1,845	22.0%
Support Costs								
Administrative Module -								
Programme Organisation	1,014		1,014		1,030		1,030	
School Liaison	100		100		100		100	
Supervisor Training	238		238		238		238	
Research and Development Module	4,868		4,868		4,868		4,868	
	6,220	92.2%	6,220	92.1%	6,236	82.6%	6,236	74.1%
TOTAL PROGRAMME COST	6,748	100.0%	6,757	100.0%	7,550	100.0%	8,413	100.0%

TABLE 7.5

COST FOR 6 CYCLE FORMATS, NON-MAINTAINED FEEDBACK SYSTEMS

	Supervisor		ATR				VTR			
			MC		HC		MC		HC	
Instruction Costs										
Academic Staff Module	479		479		479		479		479	
Software Module	12		12		12		12		12	
	491	6.7%	491	6.7%	491	6.7%	491	6.1%	491	5.9%
Facility Costs										
Enabling Resources Module -										
Housing	66		66		66		66		66	
Real Pupils	26		26		26		26		26	
Teacher Support	181		181		181		181		181	
Miscellaneous	2		2		2		2		2	
Feedback Facilities	-		9		13		225		547	
Technical Staff Module	-		-		-		427		427	
	275	3.8%	284	3.9%	288	4.0%	927	11.6%	1,249	15.0%
Support Costs										
Administrative Module -										
Programme Organisation	1,296		1,296		1,296		1,327		1,327	
School Liaison	150		150		150		150		150	
Supervisor Training	238		238		238		238		238	
Research and Development Module	4,868		4,868		4,868		4,868		4,868	
	6,552	89.5%	6,552	89.4%	6,552	89.3%	6,583	82.3%	6,583	79.1%
TOTAL PROGRAMME COSTS	7,318	100.0%	7,327	100.0%	7,331	100.0%	8,001	100.0%	8,323	100.0%

TABLE 7.6

COST FOR 6 CYCLE FORMATS, PARTIALLY MAINTAINED FEEDBACK SYSTEMS

72 STUDENT TEACHERS

	ATR				VTR			
	MC		HC		MC		HC	
Instruction Costs								
Academic Staff Module	479		479		479		479	
Software Module	12		12		12		12	
	491	6.7%	491	6.7%	491	6.1%	491	5.8%
Facility Costs								
Enabling Resources Module								
Housing	66		66		66		66	
Real Pupils	26		26		26		26	
Teacher Support	181		181		181		181	
Miscellaneous	2		2		2		2	
Feedback Facilities	12		18		265		707	
Technical Staff Module	-		-		427		427	
	287	3.9%	293	4.0%	967	12.0%	1,409	16.6%
Support Costs								
Administrative Module								
Programme Organisation	1,299		1,299		1,330		1,330	
School Liaison	150		150		150		150	
Supervisor Training	238		238		238		238	
Research and Development Module	4,868		4,868		4,868		4,868	
	6,555	89.4%	6,555	89.3%	6,586	81.9%	6,586	77.6%
TOTAL PROGRAMME COSTS	7,333	100.0%	7,339	100.0%	8,044	100.0%	8,486	100.0%

TABLE 7.7

COST FOR 6 CYCLE FORMATS, FULLY MAINTAINED FEEDBACK SYSTEMS

72 STUDENT TEACHERS

	ATR				VTR			
	MC		HC		MC		HC	
Instruction Costs								
Academic Staff Module	479		479		479		479	
Software Module	12		12		12		12	
	491	6.7%	491	6.7%	491	5.9%	491	5.3%
Facility Costs								
Enabling Resources Module								
Housing	66		66		66		66	
Real Pupils	26		26		26		26	
Teacher Support	181		181		181		181	
Miscellaneous	2		2		2		2	
Feedback Facilities	19		33		518		1,386	
Technical Staff Module	-		-		427		427	
	294	4.0%	308	4.2%	1,220	14.7%	2,088	22.8%
Support Costs								
Administrative Module -								
Programme Organisation	1,324		1,324		1,338		1,338	
School Liaison	150		150		150		150	
Supervisor Training	238		238		238		238	
Research and Development Module	4,868		4,868		4,868		4,868	
	6,580	89.3%	6,580	89.1%	6,594	79.4%	6,594	71.9%
TOTAL PROGRAMME COSTS	7,365	100.0%	7,379	100.0%	8,305	100.0%	9,173	100.0%

TABLE 7.8

CAPITAL AND RECURRENT COSTS FOR MEDIUM COST SYSTEMS, 4 CYCLE FORMATS

			ATR						VTR					
	Supervisor		NM		PM		FM		NM		PM		FM	
(i) Capital Costs	$	%	$	%	$	%	$	%	$	%	$	%	$	%
Feedback Facilities	-	-	3	-	5	-	10	-	213	-	253	-	507	-
Housing	44	-	44	-	44	-	44	-	44	-	44	-	44	-
Miscellaneous	1		1		1		1		1		1		1	
Total Capital Costs	45	.7	48	.7	50	.7	55	.8	258	3.6	298	4.1	552	7.3
(ii) Recurrent Costs														
Academic Staff	320		320		320		320		320		320		320	
Software	12		12		12		12		12		12		12	
Technical Staff	-		-		-		-		285		285		285	
Real Pupils	17		17		17		17		17		17		17	
Operating Costs	-		3		3		3		8		8		8	
Sub-total	349	5.2	352	5.2	352	5.2	352	5.2	642	8.9	642	8.8	642	8.5
Research Costs	4,868		4,868	72.40	4,868		4,868		4,868		4,868		4,868	
Admin. Costs	1,334		1,334		1,337		1,353		1,342		1,362		1,368	
Total Recurrent Costs	6,551	97.5	6,554	97.5	6,557	97.5	6,573	97.4	6,852	94.7	6,872	94.2	6,878	91.1
(iii) Imputed														
Teacher Support	121	1.8	121	1.8	121	1.8	121	1.8	121	1.7	121	1.7	121	1.6
TOTAL PROGRAMME COST	6,717	100.00	6,723	100.00	6,728	100.00	6,749	100.00	7,231	100.00	7,291	100.00	7,551	100.00

NM = Non-maintained
PM = Partially maintained
FM = Fully maintained

ECONOMIES OF SCALE

7.21. The object of this section is to provide tentative estimates of the cost of offering a microteaching programme for greater numbers of student teachers. Tables 7.9-7.11 show the components of total cost for multiples of 72 student teachers up to 350. Some of the main elements of total cost per student teacher for a medium cost fully maintained VTR system are graphed in Figure 1.

7.22. As already indicated (in paragraph 7.6 above), Research and Development costs are considered fixed and, hence, are the main source of the fall in cost per student teacher indicated in Figure 7.1. Supervisor training is also unchanged with the supervision of the number of student teachers. Nearly all other costs move almost in step with numbers of student teachers except for VTR Feedback Facility costs. For example, in Table 7.11 total cost of medium cost VTR is shown to grow from $514 to $542 as student teacher numbers expand from 72 to 350. However, as indicated in the note to Table 7.11 and to Tables 7.12 and 7.13, these estimates depend on special assumptions about the proportion of time the VTR equipment is available for microteaching and the amount of unused capacity. Expansion much beyond 350 trainees might require extra equipment, the whole cost of which would be attributable to microteaching. So, even under these special assumptions made for Table 7.11, the graph for Facility Costs in Figure 7.1 would eventually turn up if extended well beyond 350 student teachers. If it were essential that all microteaching cycles be provided in a limited time period or periods within the year, then extra equipment would be required much sooner in relation to rising student teacher numbers. Quite possibly this could occur in the expansion from 72 to 144 student teachers. In this case, the Facility Costs per student teacher could well be higher for 144 student teachers than for 72 since all the extra equipment could be costed to microteaching. Further examples could be given, but it should be clear that each institution must cost feedback facilities according to their particular usage in that institution.

OTHER COST CONSIDERATIONS

7.23. Some of the costs reported in this chapter are perhaps not typical for most microteaching programmes. Areas of cost saving for non-experimental microteaching programmes need to be identified. Cost savings directly related to Research and Development expenditures have been discussed in paragraph 7.6 and Chapter 6.

7.24. Although the current study used a fully maintained high cost video system, this again was related to the experimental nature of the programme. It is unlikely that such a high level of servicing would be required for a normal microteaching programme. A partially maintained system (as described in Appendix 7B) would be suitable for most situations and would result in considerable cost savings.

TABLE 7.9

COSTS FOR VARIOUS NUMBERS OF STUDENT TEACHERS
SUPERVISOR FEEDBACK, 4 CYCLES

Number of Student Teachers	72	144	216	288	350
Instruction Costs	332	664	996	1,326	1,658
Facility Costs					
Housing	44	88	132	176	220
Real Pupils	17	34	52	74	107
Teacher Support	121	242	363	484	605
Miscellaneous	1	2	3	5	8
Feedback Facilities					
Technical Staff					
Sub-total	183	366	550	739	940
Support Costs					
Programme Organisation	996	1,972	2,945	3,892	4,798
School Liaison	100	200	300	400	500
Supervisor Training	238	238	238	238	238
Research and Development	4,868	4,865	4,865	4,868	4,868
Sub-total	6,202	7,275	8,348	9,398	10,404
Total Programme Costs	6,717	8,305	9,894	11,463	13,002

Note: Economies of scale for course design and administration are only small because of the proportional manpower requirements of timetabling and planning to a rising in student teacher members.

TABLE 7.10

COST FOR VARIOUS NUMBERS OF STUDENT TEACHERS
ATR FEEDBACK (FULLY MAINTAINED MEDIUM COST), 4 CYCLES

Number of Student Teachers	72	144	216	288	350
Instruction Costs	332	664	996	1,326	1,658
Facility Costs					
Housing	44	88	132	176	220
Real Pupils	17	34	52	74	107
Teacher Support	121	242	363	484	605
Miscellaneous	1	2	3	5	8
Feedback Facilities	13	16	77(1)	80	83
Technical Staff					
Sub-total	196	382	627	819	1,023
Support Costs					
Programme Organisation	1,014	2,028	3,032	3,986	4,880
School Liaison	100	200	300	400	500
Supervisor Training	238	238	238	238	238
Research and Development	4,868	4,868	4,868	4,868	4,868
Sub-total	6,220	7,334	8,438	9,492	10,486
Total Programme Costs	6,748	8,380	10,021	11,637	13,167

Note: (1) A new ATR purchase is assumed necessary to meet the needs of the increasing numbers. Total annual cost of new ATR is attributable to microteaching programme. This change is based on the assumption that before new equipment is purchased microteaching could use up to 14 per cent of ATR Time. 216 x 4 trainees exceeded the limit thus necessitating additional ATR expenditure.

TABLE 7.11

COSTS FOR VARIOUS NUMBERS OF STUDENT TEACHERS
VTR FEEDBACK (FULLY MAINTAINED, MEDIUM COST), 4 CYCLES

Number of Student Teachers	72	144	216	288	350
Instruction Costs	332	664	996	1,326	1,650
Facility Costs					
Housing	44	88	132	176	220
Real Pupils	17	34	52	74	107
Teacher Support	121	242	363	484	605
Miscellaneous	1	2	3	5	8
Feedback Facilities (1)	514	521	528	535	542
Technical Staff	285	570	855	1,140	1,425
Sub-total	982	1,457	1,933	2,414	2,907
Support Costs					
Programme Organisation	1,030	2,048	3,042	4,000	4,898
School Liaison	100	200	300	400	500
Supervising Training	238	238	238	238	238
Research and Development	4,868	4,868	4,868	4,868	4,868
Sub-total	6,236	7,354	8,448	9,506	10,504
Total Programme Costs	7,550	9,475	11,377	13,246	15,061

Note: (1) Operating on a basis of using 55 per cent of VTR time. Expansion from 72 to 350 trainees can therefore be accomplished without infringing the 550 hours limit allocated to microteaching. See Table 7.12,

The increase in feedback costs represents operating costs incurred.

TABLE 7.12

VTR TIME REQUIRED WITH VARIOUS NUMBERS OF STUDENT TEACHERS, 6 CYCLES

Number of Student Teachers	Minimum Time in Hours to Complete Programme with 1 Facility	Minimum Time in Hours to Complete Programme with 2 Facilities	Minimum Time in Days with 1 Facility	Minimum Time in Days with 2 Facilities
72	108	54	18	9
144	216	108	36	18
216	324	162	54	27
288	432	216	72	36
350	525	262.5	87.5	44

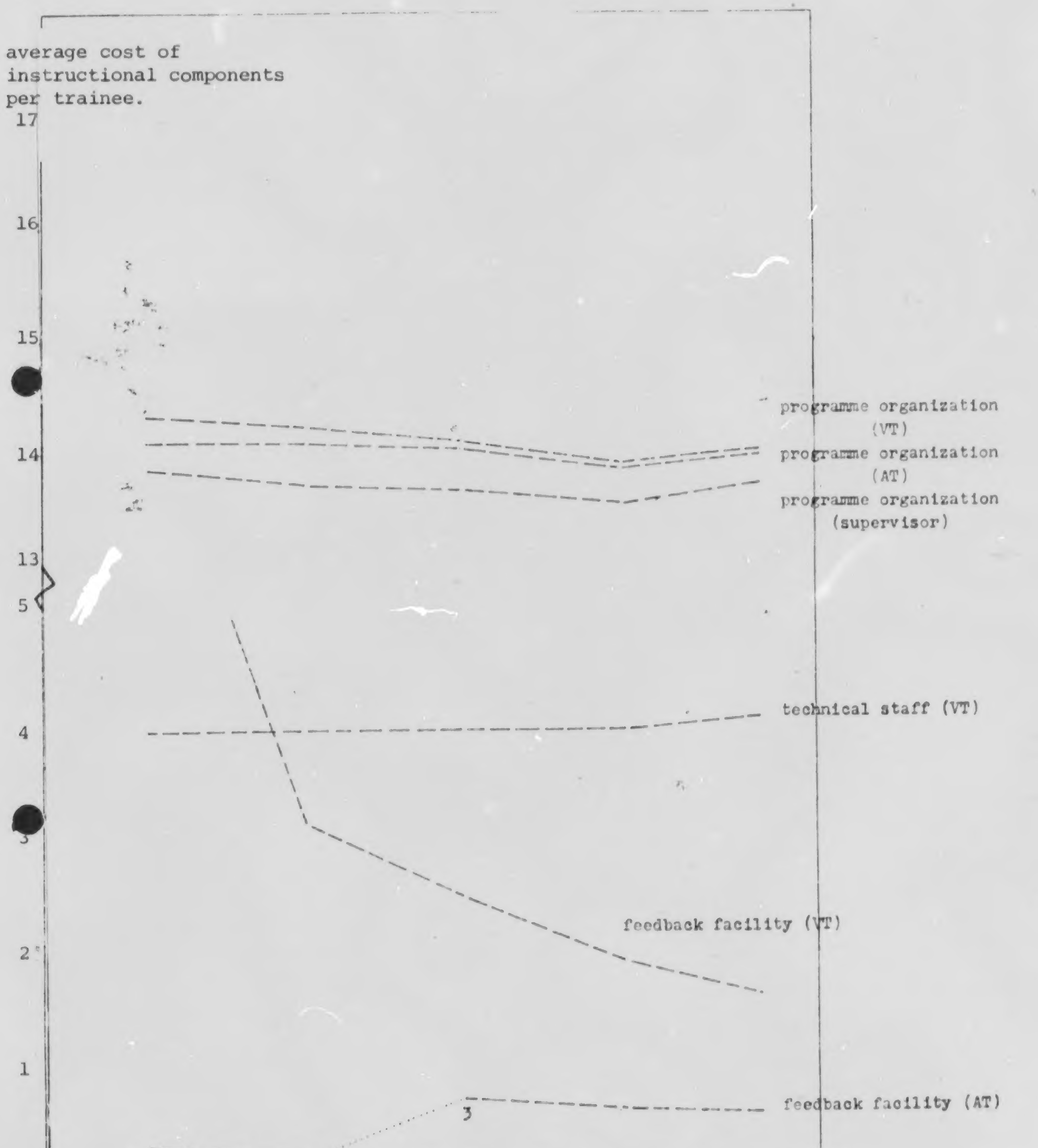
Assumptions:
(i) A microteaching cycle comprises five minutes' teach and ten minutes' feedback, i.e., a total of fifteen minutes.
(ii) Time in days refers to a six-hour operational period during a working day.
(iii) It is assumed that there is an ideal maximum usage of 1,000 hours of VTR time per academic year.

TABLE 7.13

FACILITY COSTS FOR MEDIUM COST FULLY MAINTAINED VTR SYSTEMS USING DIFFERENT ASSUMPTIONS CONCERNING USAGE

Number of Student Teachers	72	144	216	288	350
(a) VTR as used in this report, i.e. 55% of total time to microteaching, 45% to other uses (4 cycles)	514	521	528	535	542
(b) Equipment used and purchased only for microteaching (4 cycles)	934	941	948	955	962
(c) Costing carried out only on time spent in microteaching (4 cycles)	133	267	401	335	869
(d) As in (c) but for 6 cycles	197	394	591	788	959

7.1 (A) Average cost components which vary between the three feedback systems[2]

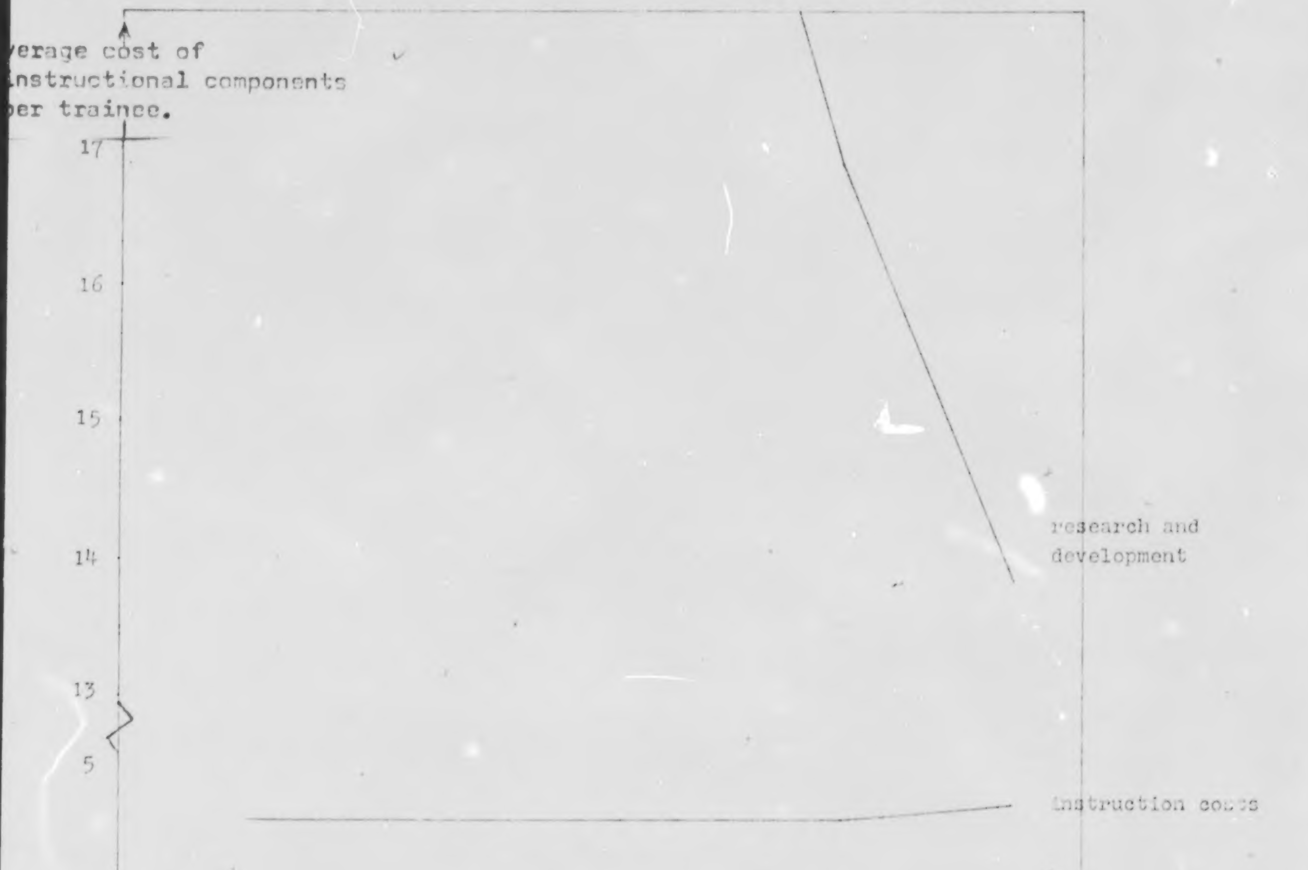


[2] Both the audio tape (AT) and video tape (VT) feedback mediums in this graph refer to fully maintained medium cost systems used in a four cycle microteaching programme.

[3] A new audio tape recorder would be necessary at this point. Refer to Note 1. Table 7.10. p. 101.

Fig. 7.1 Average cost per trainee of selected components from three microteaching systems[1]

7.1 (B) Average cost components which are common to the three feedback systems



[1] The three microteaching systems are those referred to in this report which used a four cycle programme with supervisor only, audio assisted or video assisted feedback modes.

The components contained in this graph are derived from data contained in Tables 7.9 to 7.11.

7.25. Other areas of possible cost savings for non-experimental microteaching programmes will lie largely in the area of manpower costs associated with the administrative function. For example, the relatively small economies of scale occurring in the area of programme organisation costs, when the number of cycles is increased to six (Tables 7.9-7.11), reflect the experimental requirement of having an administrator present full-time during programme implementation. However, it is unlikely that this requirement would be necessary for many non-experimental microteaching programmes, thus total programme costs would be considerably reduced if this function was not engaged.

OPTIMUM FORMAT

7.26. The analysis of the experimental data in Chapter 4 suggested that on average the number of cycles, mode of feedback or skill practised does not significantly affect the effectiveness of microteaching. Hence the conclusion that the least cost format - supervisor, four cycles and either questioning or demonstrating - appears to be the optimum on the evidence available. When account is taken of the significant interaction of audio feedback with the student teacher's score on the first teach session (see paragraph 4.17) and the very slight costs for audio feedback, then the use of ATR for students deemed 'below average' is suggested. Since VTR is more costly than other forms of feedback and could not be shown to be superior to supervisor feedback in this microteaching experiment, other evidence of its usefulness appears required before its employment in microteaching could be justified.

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APPENDIX 7-A

HIGH AND MEDIUM COST FEEDBACK SYSTEMS

A. ATR FEEDBACK SYSTEM

1. High cost

Tanberg series 15 reel to reel recorder
microphone
Purchase price (1972) $250

2. Medium cost

Phillips N2205 cassette recorder
microphone
Purchase price (1972) $74

B. VTR FEEDBACK SYSTEM

1. High cost - Total system cost of approximately $4,000

Example - Ampex 1" VTR 5230
National vidicon camera
200 mm lens
Tripod
Neck microphone
Floor microphone and stand
Audio mixer
20" monitor
Cables, etc.

2. Medium cost - Total system cost of approximately $1,600

Example - Sony AV 3600 recorder
AV 3200 camera
AV 3200 viewfinder
22-5-90 mm lens
9" monitor
Neck and floor microphone
Mixer
Stands and cables

APPENDIX 7-B

MAINTENANCE SYSTEMS

This study examines the cost implications of the three states of maintenance as applied to medium and high cost ATR and VTR systems based on the following definitions:

(1) A non-maintained system. This refers to the situation where there is no prior provision set aside for repair work in case of a breakdown. No preventive maintenance is carried out and when a machine failure does occur, some service organisation is called in to correct the component failure.

(2) A partially maintained system. This occurs when a service contract is made with either the distribution agents, or some other servicing organisation, which includes preventative servicing of equipment as well as breakdown maintenance on equipment. This study uses figures derived from the internal charges made by Monash University's Audio Visual Aids Department to other departments for service contracts on equipment items. The charges by the AVA Department are below what commercial organisations charge for similar work, so must be regarded only as a minimum figure.

A partially maintained system could also refer to the full-time employment of a technician who performs preventative and breakdown maintenance on the institution's equipment.

(3) A fully maintained system. This refers to having the capability of not only having service facilities available when breakdown occurs, but also having operational replacement units available, thus allowing for a continuous mode of operation.

CHAPTER 8

MICROTEACHING AND IN-SERVICE EDUCATION

INTRODUCTION

8.1. A consistent and significant emphasis has been made on in-service education for teachers in recent major reports in the United Kingdom (James, 1972) and Australia (Karmel, 1973). Both reports emphasise the importance of the expansion of in-service activities, but while James bases his case on the premise that pre-service education and training can only be considered a foundation (James, p. 7), Karmel stresses the "limitation in effectiveness" of current pre-service education (Karmel, p. 119). While the James Committee accorded the development of "opportunities for the continued education and training of teachers" as a matter of highest priority (p. 107), Karmel makes telling use of the phrase "teacher development", stressing that pressures of social and education changes require constant appraisal and review of classroom practices.

8.2. While this present report is not attempting to provide a detailed argument in support of in-service activities, it is most appropriate that it considers the role that techniques such as microteaching can play in any in-service programme.

8.3. De Vore (1971, pp. 1-5) provides a useful review of the stated purposes of in-service training reported in the literature. Most statements relate to notions of an "updating" in areas of educational theory, classroom instruction and performance and curriculum. Also gaining recognition is the expectation and encouragement for the teacher to derive benefit from a close look at his professional self and his working environment (Gregory, 1972). One might hope that the whole development of in-service activities would be based upon research evidence. However, when one moves from statements of objectives to the actual process, most reports are of narrative form and the conclusions merely inferred or implied. There is little evidence which leaps the chasm between a description of what was done and the much needed data on exactly what was achieved by a particular programme. This is very true of reports of in-service activities which cite the use of microteaching. However, in spite of all this, the microteaching technique would appear an appropriate format for observation and practice of many of the stated objectives of in-service education.

8.4. One of the few efforts made to evaluate an in-service programme employing the microteaching techniques has been carried out by the Far West Laboratory. Under Borg's momentum (1969, 1970), the Far

West Laboratory launched into the production of the now well-known 'mini-courses' aimed specifically at the already practising teacher. A mini-course package consists of a series of model demonstration videotapes or films on a specific teaching behaviour or skill which is accompanied by a teacher's work manual containing detailed step-by-step procedures for the teacher to follow. A co-ordinator's handbook is also supplied. The purpose of the co-ordinator's manual is to explain the administrative function of implementing an in-service training programme when schools or school districts adopt the mini-course as a regular part of in-service training.

8.5. Publicity pamphlets which accompany the mini-course packages assure the purchaser of a definite improvement in the quality of teachers who undertake such courses (with a money-back guarantee if they don't), and present field test data purporting to illustrate the effectiveness of such packages. However, there has been some resistance to the use of the mini-course approach (Guelcher *et al.*, 1970) and questioning of its basic format (Peterson, undated). The main criticism centres around the criteria of attainment used in the programmes. Each programme has a set of behavioural objectives towards which the training is directed. It is argued that the specified levels of performance contained within these objectives are based on quantity rather than quality, e.g., the proportion of higher-order questions asked by teachers will constitute not less than 60% of all questions the teacher asks.[1] This criterion has the implied assumption that quantity is somehow associated with quality and also carries the added assumption that increasing the number of higher-order questions asked by the teacher improves pupil learning.

8.6. Resistance to mini-courses in Australia reflects the above arguments and there is also a feeling that they carry a certain amount of cultural bias as well as being relatively expensive (e.g., $1,600 per mini-course compared to $90 for the Sydney micro-skills).

8.7. Following the mini-course idea, several other attempts were made to produce material aimed at the improvement of teaching methods of already practising teachers, of which two in particular are worthy of mention - T. B. Gregory (1972) and Emmer and Miller (1970).

PROGRAMME PACKAGE

8.8. The programme package called the Monash In-Service Teacher Programme (MIST) designed for the current study, provided each teacher with a workbook[2] containing a detailed description of the skill of questioning, plus support material and an audiotape with examples of the use of voice in questioning.

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[1] See the Revision of the Basic Programme Plan of the Teacher Education Programme, Far West Laboratory for Educational Research and Development, August 1970, p. TE 8.

[2] A sample of the revised workbook is contained in Part B of this report.

8.9. While the experimental design itself would supply performance data and data relating to the optimum mode of feedback presentation, the reported experimental situation was also a foray into a relatively unknown field, where little is known regarding teacher reaction to such programmes. Hence the work manual was designed in such a way as to supply additional feedback to the researchers on the following points:

8.9.1. A description of the teacher in terms of years of teaching service and subject taught.

8.9.2. Reaction by each teacher to the subject matter of the manual.

8.9.3. Suggested alterations in the presentation and level of content of the work manual.

PRODUCTION OF THE WORK MANUAL

8.10. As already mentioned, the in-service programme was designed so that it could be implemented, paced and evaluated by teachers already in schools.

8.11. Certain aspects of the mini-course developed by the Far West Laboratory were adopted for the MIST programme. These were:

8.11.1. The use of microteaching concepts in the practice element of the programme.

8.11.2. The provision for active learning by the inclusion of work exercise programmes and provisions for lesson plans within the manual.

8.11.3. The provision for self-evaluation.

8.12. However, in view of the reaction against the mini-course style of presentation, it was decided that the content of the work manual should be:

8.12.1. Presented at a more complex level than is present in mini-courses.

8.12.2. Less behaviourist oriented in the self-evaluation procedures. In some respects this meant a compromise between presenting tight behavioural objectives with in-built performance criteria which concentrated on quantitative aspects of behaviour performance, and completely subjective evaluations of quality performance. The compromise resulted in self-administered rating scales which were based on the statement of objectives occurring at the beginning of each chapter in the manual.

8.13. Bloom's Taxonomy of Educational Objectives was used to provide a hierarchy of types of questions for successive practice by the teacher. As the teacher progressed through the programme, he would become proficient in the use of a greater range of questions, thus increasing the size of the "pool" of questions available to him for maintaining the most appropriate response-reaction chain emerging from the pupil teacher interaction.

EXPERIMENTAL DESIGN

8.14. For reasons similar to those discussed in Chapter 4, the research centred around the modes of feedback. This provided the following null hypothesis:

> "In the use of microteaching for the in-service education of teachers, there is no optimum situation in terms of mode of feedback."

8.15. In preparing the experiment design, and planning for its implementation, a number of restraints was recognised:

8.15.1. The in-service programme would have to be undertaken in the teacher's own time.

8.15.2. Because of 8.15.1., the programme would have to provide for "spaced" practice.

8.15.3. The incentive to undertake the programme would be intrinsic as no provision could be made for financial or career advancement.

8.15.4. The programme would need to be completely self-contained, as no provision could be made for a supervisor to visit and provide feedback at the end of a microteaching cycle.

8.16. An early survey showed that only a limited number of teachers would be available to take part in the programme. It was appreciated that this would impose difficulties in implementing the initial design which called for a relatively large number of subjects. As the pre-service study had failed to show any significant difference between the skills of questioning and demonstrating it was decided to limit the number of skills for the in-service study to that of questioning, thus reducing the number of subjects required.

8.17. The final experimental design was a simple block design providing for three experimental cells relating to mode of feedback (Table 8.1).

TABLE 8.1

EXPERIMENTAL DESIGN

Feedback type	Videotape Replay	Audiotape Replay	Unaided Self-Evaluation
No. of subject	7	7	7

8.18. Prior to commencing the programme the teachers were asked to prepare a 10-minute lesson segment based on the information contained on a Roneoed instruction sheet. This lesson, when performed, was recorded and held on videotape to provide the pre-test situation. The teacher's final teach situation was also recorded on videotape and constituted the post-test situation. As in the pre-service programme reported in Chapter 4, an individual's score for both pre- and post-test situations was a summation of the rated scores on the three sub-scales on the Monash Microteaching Inventory.

IMPLEMENTATION

8.19. To obtain 21 volunteers to fulfil the experimental design requirements, 14 eastern suburban high schools were approached. These schools had an estimated total population of 600 teachers.

8.20. Volunteer teachers were placed in the experimental cells on a random stratified procedure to ensure that each cell was balanced in terms of each subject's years of teaching service and subject area.

8.21. In organising the MIST programme, it was envisaged that teachers would proceed through it at the rate of one chapter per week, with the total programme spread over five weeks. This estimation was based on the assumption that the total time required by a teacher to work through a chapter would be a maximum of one and a half hours per week.

8.22. The MIST manual was divided into two parts, the first part consisting of Chapters 1, 2, 3, 4, being given to the teachers immediately after the pre-test teach situation, and the second part (Chapters 5 and 6) being personally delivered to the teachers two to three weeks after they received part one. This procedure was adopted so that the researchers could obtain an early impression on each teacher's progress through the programme. By breaking the manual into two parts, then, an unobtrusive monitoring system was made available.

8.23. Those teachers requiring video feedback were required to contact the researchers when they were ready for a teach session, so that the necessary recording could be made. It was also the teachers' responsibility to contact the researchers prior to their final teach session so that this could be recorded on videotape for assessment purposes.

8.24. Apart from the monitoring system described in paragraph 8.22, the only formal contact intended with the teachers was during the pre- and post-test situations.

DISCUSSION

8.25. Only eight teachers completed the programme with completion time ranging from 4-11 weeks. Seven teachers failed to make a start on the programme and six withdrew after about five weeks. The principal reason given by those withdrawing was the lack of time available during a normal school day.

8.26. In terms of explaining this poor rate of completion an underestimate of the implementation time is only one possible answer. There may well be other problems associated with the materials and/or programmes of this kind which need to be further investigated.

8.27. As only eight out of the 21 teachers completed the programme no data analysis was considered justified and hence the stated null hypothesis could be neither accepted nor rejected. From Table 8.2 it can be seen that four out of the eight teachers did improve their score while three teachers had negative difference scores between the pre- and post-tests. These three teachers were the least experienced teachers of the group; the other five having had substantial teaching experience. In fact as a group they averaged 20 years' teaching experience.

TABLE 8.2

PRE- AND POST-TEST RESULTS

Subject	Pre-test Score	Post-test Score
1	88	92
2	85	109
3	85	90
4	100.5	107
5	90	90
6	85	79
7	98	96
8	83	82

8.28. Although only eight teachers finished the programme, nine teachers responded to the questionnaire (Appendix 8-B) which was included in the MIST manual. This extra teacher had completed four sessions of the programme, so his responses are reported here along with the eight teachers who finished the programme.

8.29. Five participants were divided in their overall assessment of the programme. Of three persons suggesting the programme was either "very helpful" or "excellent", two persons commented on the time involvement required by the programme. The consistent comment of the two persons suggesting the programme was "helpful in parts" was that the objectives set down were already components of their own teaching and, in this sense, the programme was irrelevant or unnecessary.

8.30. All replies indicated that this form of programme should be more widely available and could include other areas appropriate to classroom practice, e.g., counselling, group discussion techniques, education technology, discipline.

8.31. Two themes dominated the comments made at the conclusion of individual phases of the programme.

8.31.1. The appropriateness of Bloom's taxonomy as an instrument for outlining classroom behaviours and/or questioning skills. Some participants felt the concentration required to master the taxonomy detracted from the objectives of the programme.

8.31.2. The self-evaluation materials were a source of general concern. Participants felt the need for an external observation and assessment of their efforts. They found the materials easily comprehensible and workable; however, they felt nervous or inadequate in the role of assessor of their own efforts.

COST ESTIMATES

8.32. The experimental study described above constituted a special rather than a generalised form of in-service programme. These special conditions arose from the fact that it was an experimental study, conducted over a limited period of time and using a limited number of subjects (i.e. participating teachers). In addition there was the need to provide some hardware and technical support from the University's Higher Education Research Unit, whose prime function is not that of a resource centre. In fact in order to introduce some notion of generalisation into the cost estimates the research unit was considered analogous to a resource centre. This enabled equipment cost and staff time supplied to the programme to be calculated on a pro rata time basis.

8.33. As large-scale in-service programmes would be conducted over much longer periods of time and be designed to cater for a much greater number of participating teachers, they would probably require full-time academic and technical staff. Such staff would probably operate from a resource or teacher centre fully equipped for the specific purpose of in-service training.

8.34. Due to these basic differences between the experimental programme and the more probable organisation of a full-scale in-service programme, this study does not attempt to extrapolate cost estimates from one to another.

REPORTED COSTS

8.35. In the light of paragraph 8.34 only those costs directly incurred by the programme are reported. Where teachers used equipment and resources such as buildings belonging to the school these were considered to be 'inherited' and hence no charge to the in-service programme. Other costs not reported are those relating to participating teachers and pupil time as there was no indication that they had foregone other duties while taking part in the programme.

8.36. As with the findings reported in the pre-service costing, costs associated with research and development and the production of software material did not change the different modes of feedback.

8.37. Unaided self feedback required no hardware and hence this feedback format carried no cost. Audio assisted feedback was completely organised by the participating teachers and the equipment was provided by the schools so again there were no costs associated with this feedback format. This was not so in the case of video assisted feedback. The schools involved in the programme did not possess complete video systems so these resources plus technical staff to operate the equipment had to be provided by the "resource centre".

8.38. Because VTR equipment could not be considered as inherited, video assisted feedback was identified as being the most costly format. The higher costs for this format were directly related to the need to provide technological services. Such cost would not have arisen had schools been able to supply and operate their own video equipment. In these circumstances the technological resources would have been considered as inherited and hence no charge to the programme.

CONCLUSIONS

8.39. Due to inadequate numbers of participating teachers completing the programme no statement as to the relative effectiveness of any of the experimental feedback formats can be made. Feedback from the teachers indicated that the overall scheme of the MIST programme was worthwhile and should be followed up. However, general concern was expressed about the difficulties involved in self-evaluation, irrespective of feedback format. There is evidence arising from teacher comments to suggest that perhaps thought should be given to producing materials at different levels based on a classification of years of teaching service.

8.40. The cost data indicates that there is little or no difference between the cost of unaided self feedback and audio assisted feedback. This would also be true of video assisted feedback if the technical resources for the feedback format could be considered as inherited. However, if technical resources need to be supplied from a resource, then obviously both the audio and video assisted feedback formats would become more expensive than the unaided self feedback with video assisted feedback being the most expensive.

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APPENDIX 8-A

QUESTIONNAIRE TO PARTICIPATING TEACHERS

Could you please complete the following questionnaire so that background data for future in-service training programmes can be obtained.

Q_1. Overall, how do you rate the MIST programme in terms of improving your teaching techniques?

No help at all	Helpful in parts	Helpful	Very helpful	Excellent
1	2	3	4	5

COMMENTS

Q_2. Would you like to see this type of in-service training made more widely available?

YES NO Tick applicable response

COMMENTS

Q_3. What areas of professional teaching behaviours and skills would you like to see covered by in-service training programmes?

Q_4. Was the MIST programme adequately self-contained in that you felt confident to proceed through the entire programme?

Unsatisfactory	Improvement needed	Adequate	More than adequate	Excellent
1	2	3	4	5

COMMENTS

Q_5. Why did you volunteer for this programme?

Q_6. What areas of the MIST programme do you feel need to be altered, and why?

Any further comments that you may like to make in relation to the MIST programme.

CHAPTER 9

DISCUSSION

9.1. The main findings from the present study have been documented in each of the appropriate chapters, and it is not the intention in this chapter to provide a detailed summary of these findings. Instead an attempt will be made to consider some of the implications both theoretical and practical of the findings and their importance for the implementation of a microteaching programme.

9.2. The findings from the present study, i.e., that the majority of student teachers did improve their criterion score between first and last microteaching cycles, supported the evidence from the literature that microteaching is an effective technique. It was on this assumption that the design of both the pre- and in-service studies was based, thus eliminating the need for a control group to compare microteaching with another technique. The principal concern of the study was to establish if there was any one teach/reteach format which was more effective than another.

9.3. While microteaching is an effective technique, the literature survey and results of the pre-service study did not substantiate Perlberg's conclusion that

> *"The effectiveness of videotape recordings and playback techniques has been confirmed in a number of studies in teacher training."*
>
> (p. 549, 1972)

In the current study the addition of videotape replay to the feedback session did not produce significant changes in the role or quality of the skill learnt and hence supports the doubts of the value of self-confrontation as a general technique.

9.4. The cost estimates (Chapter 7) show that overall the provision of feedback to the student teacher by a supervisor using videotape to provide self-confrontation increased the cost of the microteaching programme while reinforcing the inherent low productivity profile of the microteaching technique. When this increased cost is related to the lack of increased effectiveness of the format, it is obvious that the addition of videotape equipment to the microteaching feedback session is not a warranted cost.

9.5. In interpreting these results, a number of limitations to the present study require further elaboration and discussion. At the time this study was designed and implemented (1971-72) the findings reported in the literature as to the effectiveness of the microteaching technique were results from what has since been termed "first generation research". The main emphasis, at least in Australia, was on the feedback element and in particular the use of videotaped replay for self-confrontation (Clift and Malley, 1971; Turney, *et al.*, 1973). This use of 'hardware' in the feedback process appeared at the time to provide the greatest contribution to the cost of a microteaching programme, and as the study was concerned with costs it appeared to be the most appropriate aspect to concentrate on. Concern with the teach/reteach cycle was also reinforced by the lack of resource materials available at that time for use in the pre-teach situation. In fact it was not until the Teaching Skills Development Project at Sydney University[1] began publication that resource materials for the pre-teach sessions became commercially available.

9.6. The justification for the cost of providing television to provide a self-confrontation situation for the student teacher must depend upon its effectiveness to produce change. What evidence is there as to the role of television in the learning situation and, more specifically, what is the role of self-confrontation in creating change? As far as the authors of this report have been able to establish these questions have not as yet been the subject of specific research in the microteaching area.

9.7. Feedback or knowledge of results appears to have both an informational and motivational role. It can provide a standard of performance for the student teacher to aim at and it can provide information to enable the student to take the necessary corrective action to enable him or her to reach this standard. Taken together, these two categories of information act in an incentive role (Annett, 1969). Recent studies (Tuckman and Oliver, 1968; Wagner, 1973) have produced evidence to indicate that this 'standard of teacher performance' is more effectively transmitted by the analysis of models of the required behaviour presented prior to the practice session. Alper *et al.* (1972) came to the conclusion that both modelling and feedback are essential elements in the skill learning process for student teachers. In their study they found that while modelling promoted the initial change in the student teacher behaviour, feedback served to maintain or to accelerate the level of performance towards the required standard. It would appear thus that feedback on its own is insufficient for facilitating change but will reinforce retention of the learnt skill.

9.8. Given a microteaching programme providing a sound preparatory stage in which programme standards are well established, it is possible that the more experienced student teacher could with the aid of either an audio or video replay of their performance provide their own performance analysis. But, although the evidence is inconclusive, Griffiths (1972) contended that for the inexperienced student teacher the presence of a supervisor to provide the feedback does appear necessary. This conclusion is in keeping with the findings from a much earlier study by Vernon (1953) into student understanding of material presented by television. Relevant to the present discussion was her conclusion that the particular appeal of TV does not automatically produce accurate impressions and hence there is a need to provide "logical coherent verbal statements" to "tie" the visual material together. Without such guidance and structure the student's own emotional response will tend to distort his perception and retention of the visual material. Vernon's study dealt with cognitive learning and it may well be that in the microteaching situation where learning involves psychomotor and affective elements as well as cognition this emotional factor plays a dominant role. Kagan and Krathwohl (1967) have in fact shown that there is a strong emotional reaction when people view themselves on TV. It is this emotional reaction which Fuller and Manning (1973) in their review of the literature related to self-confrontation found the protagonists of the technique stressed. This emotional reaction involving fear and anxiety (Holzman, 1969) is quite different from the so-called cosmetic effect in which viewers tend initially to concentrate on their own physical self. While the cosmetic effect has been shown by Bedies and Webb (1971) to suffer considerable reduction following repeated viewing, the emotional reaction does not suffer such dissipation, and Fuller and Manning cite a number of studies antagonistic to the use of self-confrontation on this very ground. The evidence would seem to suggest then that self-confrontation can be just as harmful to some students as it is helpful to others.

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[1] See Turney, C. *et al.*, *Sydney Micro Skills Series*, Sydney University Press.

9.9. The current study did not consider supervisor style as an experimental variable, nor did it provide for any extensive training scheme to prepare supervisors for their task.[2] In the light of a number of recent studies, particularly that by Moore (1973), a teacher's "teaching style" including the way in which he uses audio-visual information is a most important variable in a learning situation. In her study Moore found that she was able to identify at least three styles:

(a) Deductive, lecture-oriented. These teachers emphasized rules and presented material before asking questions.

(b) Inductive, question-oriented. Teachers in this group used many questions to introduce subject matter.

(c) Inductive, lecture-oriented. Teachers in this group emphasized relationships, presented subject matter and used questions to monitor learning.

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[2] This was due to a problem of resources rather than a lack of appreciation of the importance of this factor.

There was also a number of her subjects who did not fit any one of these categories. If teachers do use different teaching styles, then how do these interact with student learning styles referred to by Parlett (1967) and Ausubel (1968)? Moore (1973) suggests the possibility of a close relationship.

> *"Recent pilot research on interaction among teachers who were matched or mismatched with students according to filed dependence/ independence suggests that the cognitive level of classroom discussion and the amount and nature of teacher/student interaction may be related to the cognitive style of both teacher and students."*
>
> (p. 35).

Concern for adapting instructional methods to students is not new. As far back as 1962 McKeachie provided a review of the relevant literature, and later studies such as those by Goldberg (1969), Chavers *et al.* (1970), Tallmadge and Shearer (1971), and Pascal (1972) have all confirmed a significant interaction between student characteristic and instructional technique.

9.10. In the light of the above evidence it is not surprising that in the current study the most significant variable measured was the single student teacher characteristic, that is, student teacher score on first teach session. Not only was it significant in relation to student teacher performance (Chapter 4, para. 4.14), but audio feedback had a positive effect on performance of student teachers with a low entry score and a negative effect for those with a high entry score (Chapter 4, para. 4.17). Further indication of variation in individual student response to microteaching is to be found in the fact that, although the group as a whole showed a significant improvement between first and last sessions, there was a number of student teachers whose performance did not improve significantly and others whose performance actually deteriorated during the microteaching programme. One possible explanation for these findings could be the different reaction of students to the instructional techniques, the supervisor style, the use of self-confrontation, etc. Another possible explanation could be the student teacher reaction to the skill to be learnt. If the student teacher possessed a natural teaching style not in accord with the designated teaching skill or strategy, then his reaction to the set task may well inhibit a satisfactory performance.

9.11. The existing evidence from the literature and the findings from the current study provides a strong case for a selective approach in the application of both the technical skills approach and self-confrontation when using the microteaching technique in the preparation of student teachers. The suggestion of the need for matching not only the student teacher with the supervisor but also the student and supervisor with the feedback format has a number of practical implications in regard to programme implementation for large numbers of student teachers.

9.12. In the current study the cost of television equipment was based on its purchase or provision for use in each and every feedback session of the microteaching programme. As long as television recording and replay equipment is purchased solely for this purpose, then it will remain an expensive aid of doubtful effectiveness. The strongest argument in favour of a purchase of CCTV equipment for a teacher education programme should, from a cost point of view, arise not solely from its planned need in the teach/feedback cycle but from other applications within the microteaching programme and ideally from additional needs associated with the total teacher educational programme. It is clear from this and the discussion in Chapter 6 that the concept of opportunity costs has an important bearing on final programme costs.

9.13. If self-confrontation was only to be used in selected feedback sessions and not applied as a blanket to the total programme, and given a central pool of equipment, as was available to the authors of this report, then there could be considerable savings to the total programme cost. Such an arrangement would appear to be a much more viable proposition.

9.14. While multi-mission use of equipment may lower its cost to any one programme, there is a need for careful selection of equipment if it is to be used for a number of wide-ranging tasks. For example, while ½" video equipment is satisfactory for self-confrontation purposes, it is not ideal for the production of audio-visual teaching models. This is particularly true if it is intended to take a number of copies from the master tape. For such multi-use the more expensive 1" equipment is necessary.

9.15. While the provision of real pupils for the micro-class does increase the cost of a microteaching programme, to substitute peers for the real pupils would decrease the educational effectiveness of the technique. However, it has been observed that tertiary teachers do not appear to exhibit the same degree of concern about the artificial nature of peer teaching. This would suggest that the need for real pupils in the micro-class may be less important as the characteristics of the peer class approaches those of the target pupils.

9.16. The major cost saving areas for the programme as a whole appear to be those associated with the research and development function. This aspect has already been discussed in Chapter 6. However, there is a need to stress again the implications, particularly those arising from the concept of obsolescence, of completely eliminating any monitoring or evaluation component from the programme.

9.17. For example, it has generally been accepted that the technical skills approach to the analysis of teaching gave substance to the microteaching technique, but the failure of later research to identify specific "skills" or to reach agreement as to what are the basic skills of teaching (Flanders, 1973) would suggest that the concept of component skills was accepted too readily. There is now a move away from the specific skill situation to an interaction approach, as illustrated by the Chicago School and lately by the Stanford School. Such a change calls for changing software and illustrates the importance of the concept of obsolescence in costing such instructional programmes. Obsolescence is not restricted to equipment but in educational programmes applies equally to the software of the programme and even the concepts upon which the programme is based.

9.18. A number of reasons could be advanced for the failure of the in-service programme. From comments made by a number of the teachers who were approached to take part in the programme it would appear that such programmes need to offer incentive payoffs such as promotional points to the participants. However, the discussion regarding the use of the microteaching techniques, and of the self-confrontation technique in particular, is just as relevant for in-service as it is for pre-service programmes.

9.19. This discussion has probably raised more questions than it has answered, but it does illustrate the limit of our knowledge and understanding of the teaching process or the strategies best suited to facilitate the learning and retention of complex skills. The conceptual problems discussed in earlier chapters and again in these paragraphs also indicate that there will be no one common cost effectiveness decision for all institutions engaging in microteaching. However, the method developed for such an analysis will possibly help institutions, if not to cost their own programming, at least to appreciate some of the cost implications of their actions.

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A COST EFFECTIVENESS STUDY OF THE USE OF MICROTEACHING IN THE EDUCATION OF TEACHERS

PART TWO

J. C. CLIFT
H. D. BATTEN
G. BURKE
J. I. MALLEY

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CHAPTER 10

DEVELOPMENT OF AN INSTRUMENT FOR MEASUREMENT OF SKILL ATTAINMENT

CONSTRUCTION OF THE RATING SCALE

10.1. As discussed in Chapter 2, the microteaching technique is dependent upon the analysis of the teaching act into its component skills. Exponents of microteaching, notably Allen and Ryan (1969), Cooper and Allen (1970) and more recently Turney *et al.* (1973), have produced lists of teaching skills which could be practised using the microteaching technique.

10.2. Although the arguments for and against the component skills approach have been fully discussed[1] it is worthwhile to reiterate here two of the arguments which had a direct bearing on the design of the experimental task and associated rating scales. Firstly, while the most widespread use of microteaching has centred on utilising the component skills approach, very little investigation and validation of these component skills of teaching has occurred (Cooper and Allen, 1970, p. 25). Secondly, based on survey evidence (Clift and Malley, 1971) and overseas work (Guelcher *et al.*, 1970), rather than reducing the complexities of the normal classroom for ease of practice of individual skills, it has actually created complexity for the student teacher: the complexity resulting from the unreality of practising only one skill to a set criterion of success which did not take into account the response-reaction-response sequence of classroom verbal interaction.

10.3. Part of the difficulty arises from a failure in the analysis of the teaching act to distinguish between the level at which the 'component skill' occurs in the hierarchial structure of the job 'teaching'. For example, an examination of the skills listed by Cooper and Allen (1970, p. 27) revealed that what have been commonly given the blanket description of 'component skills' are in fact a composite of activities which include duties, tasks, skills and elements of skills.[2]

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[1] See Chapter 2, para. 2.43-2.44.

[2] A useful discussion on the construction of task inventories is contained in Morsh, J. E., Madden, J. M. and Christal, R. E. *Job Analysis in the United States Air Force.* 1961.

10.4. Based on a job analysis model[3] a duty (i.e. a major activity performed by a teacher) is placed at the top of the hierarchy, a task is then a unit of activity forming a significant part of that duty, and a skill becomes one of a number of abilities required for the successful carrying out of the task. Skills or, as they are sometimes called, techniques are not mutually exclusive to any one duty and can themselves be further analysed into elements or components. Using the teaching of a lesson on a given topic as an example of a duty, the following 'component skills' from the literature can be fitted into the model thus:

Tasks

Set induction
Closure
Communication

Skills/Techniques

Reinforcement
Stimulus variation
Lecturing
Completeness of communication
Questioning
Demonstrating
Cueing

Components of Skills/Techniques

Fluency in asking questions
Probing questions
Higher order questions
Divergent questions
Recognising attending behaviour
Silence and non-verbal cues
Verbal cueing
Use of examples
Planned repetition

10.5. Classification into one or other of the model's categories was based on the answer to the question, "Are there any sub-components of this item of behaviour, and if so what are they?" For example, in order for communication to take place, certain items are given meaning only when viewed against a larger section of work; therefore, items such as silence and non-verbal cues are components of the skills, stimulus variation or cueing or reinforcing. That is, they help in the achievement of specific techniques such as stimulus variation which in turn is used to achieve some defined educational task.

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[3] The model used was that designed for use in the Royal New Zealand Airforce and reported in *Instructions for Writing Trade Specifications*, Vol. 1, General, M.O.D., N.Z. (1968).

10.6. Teaching tasks are often influenced by social expectations placed on the role of the teacher and thus may change over time. Of a more stable nature are the skills and components of teaching and, while microteaching can be seen as being useful for practice of activities, at all levels below and including that of tasks, it is of greater value in the development of specific skills, techniques and components of skills.

10.7. The original experimental design called for the evaluation of three 'skills', set induction, questioning and demonstrating, drawn from the Stanford model. However, on the above classification scheme "Set induction" was seen as a task and, hence, at a different level from either questioning or demonstrating. The decision was therefore taken to provide a task setting in which the student teachers could practise the designated skills. The task set was that of opening a lesson (set induction), and student teachers were asked to emphasise either questioning techniques or demonstrating techniques[4] in relation to achieving this prescribed task.

Task	Set induction	
Skills	Questioning	Demonstrating
Components	To be left to each student teacher's discretion to use appropriate skill elements for the given situation.	

10.8. The choice of measuring instruments available was of two extremes. In the first instance, were measuring instruments such as the Flanders system, which attempts to describe the whole teaching behaviour and, on the other extreme, were the component skill instruments developed by Stanford University to specifically measure particular components of the teaching act. For this particular study the overall measures of teaching behaviour such as the Flanders system were not detailed enough, while the more specific systems such as the component skills instruments of Stanford were thought not to reflect adequately the reality of a teaching situation. The experimental requirements were such that the evaluative instrument was required to discriminate between the use of verbal (questioning) and non-verbal (demonstrating) skills. The conceptual development of the job teaching further demanded that the use of verbal skills and non-verbal skills be measured as taking place within the act of teaching and using a multitude of components which are not necessarily mutually exclusive.

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[4] Questioning and demonstrating were seen to be along a verbal continuum in which questioning was placed as being more verbal than demonstrating.

10.9. In developing the instrument for the current study, a list of descriptive rating items for the skills of questioning and demonstrating was derived from behavioural objectives suggested by the literature and during brainstorming sessions by staff of the Higher Education Research Unit. This list was then circulated to staff members of the Education Faculty and practising secondary school teachers who ranked the items for each skill in what they considered to be the most important order. Keeping in mind that the raters would be limited to a five-minute segment of the student's teaching upon which to base their assessment, only those items which appeared with a commonly high ranking were selected for use in the measuring instrument. An examination of the selected items enabled the majority of them to be placed into four categories - verbal general, verbal specific, non-verbal, voice and speech. Due to our incomplete knowledge of the range of skills involved in the art of questioning and demonstrating and the fact that some of the original objectives were not included in the measuring instrument, it was considered advisable to introduce a category which provided an overall impressionistic opinion of the students' skill in the performance of these tasks. The four specific areas contained a number of rating items and as such could be viewed as sub-scales, while the overall opinion on teaching ability was provided for as a single item sub-scale, the Gestalt Whole (Appendix 10A). These objectives were then treated as criterion items and were rated on a seven-point scale by a team of five raters, each rater assigned to a specific sub-scale of the overall rating scale.

10.10. During preliminary reliability trials it was found that raters felt that the seven-point scale did not allow sufficient discrimination. As a result, raters began to use half-point scores within the seven-point scale, thus effectively expanding it to a 13-point scale. The rating procedure has already been described in Chapter 4, paragraph 4.9. Having obtained the ratings of the students' performances, the first and final sessions' scores (i.e. the rated score on the students' first and last microteaching lesson) on the 27-item battery were subjected to factor analytic procedures.

FACTOR ANALYSIS OF THE MONASH MICROTEACHING INVENTORY

10.11. The purpose of the factor analysis. Factor analysis was applied to the 27 items making up the Monash Microteaching Inventory in order to:

10.11.1. Test the validity of the 'a priori' grouping of the 27 items into five sub-scales. This method of validation has its origin with Spearman's and later Thurstone's attempts to validate 'a priori' factors of human intelligence (Harman, 1970; Horst, 1965). Validation of the dimension presupposed by the items contained within each sub-scale is based on the notion that if the complete battery of items is subjected to factor analysis, the items contained within the derived factors should substantially reflect the structure of the 'a priori' sub-scales. If the items correlate highly only with items contained within the same sub-scale and the emerging factor is factorally pure, then it can be inferred that the particular dimension has validity and probably measures the particular dimension of teaching behaviour thought to be identified by that sub-scale.

10.11.2. Establish whether there was a constancy of factor content of the 'a priori' dimensions over a number of analyses. By establishing a case for factor invariance, greater weight can then be given to the validity of the dimension.

10.11.3. Reduce the overall number of items used to evaluate student teacher performances during microteaching (Fruchter, p. 1).

10.12. The factor analysis programme used for the major part of the reported investigation was a minimum residual factor analysis model (Minresfa) developed by A. L. Comrey (1965). This programme computes from raw data a correlation matrix of Pearson correlation coefficients, then extracts factors using the minimum residual method. An orthogonal rotation of factors is then carried out using the normal varimax method.

10.13. The application of Minresfa to the data was as follows:

(1) Factor analysis was applied to the first session rating scores of the 27 items of MonMI.

(2) Factor analysis was applied to the final session scores of the 27 items of MonMI.

In both situations Minresfa was programmed to extract, if possible, 10 factors from the data or to stop factoring before this point if convergence took place.

10.14. As a result of the factor analysis on the item scores of the first and final sessions, a third factor analysis was carried out allowing only as many factors to be extracted as substantially contributed to the total cumulative variance of these sub-scales.[5]

10.15. In order to free the analysis from possible criticism relating to the intercorrelation of items between factors, a Promax oblique rotation[6] was carried out on the final session Varimax scores. As Child (1970) states, *"Oblique rotation with behavioural variables is an admission that most, if not all, human characteristics are correlated to some extent, and the underlying major factors must be similarly correlated."* (p. 60).

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[5] For a discussion on the role of variance in factor analysis refer to Child (1970), Harman (1967).

[6] Refer to Hendrickson and White (1964) for a technical discussion on the elements of oblique rotation. The Promax programme used was an adaptation of a programme used by the British Psychological Society (Hallworth, 1965).

10.16. Factor analysis on first session scores. Three factors emerged as contributing to total unit variance (Table 10.1).

10.16.1. The first factor contributed 32.9% to the total unit variance and shows a very complex structure. Items with loadings exceeding a 95% level of significance[7] include all items from the Verbal Specific sub-scale (items 7-16) as well as item 4 (teacher-student interaction) from the Verbal General sub-scale, and three of the four items from the non-verbal sub-scale (i.e., items 17, 18 and 19). With a factor loading of .398, the contribution of the gestalt whole to this factor is just below the 95% level of significance.

10.16.2. The second factor substantially reflected the Voice and Speech sub-scale. Distinction of voice, variety, vocal projection, control of pitch and fluent delivery items all had significant factor loadings beyond the 95% level of significance.

10.16.3. Factor 3 reflected a non-verbal type of behaviour in that rather than specific verbal behaviours relating to content, analytical aspects such as the quality of teacher talk (2) and the pace of presentation (6) were significant, along with the behaviours of looking at pupils (17), the use of non-verbal cues (18), and confusion or silence (20). As the impressionistic view of the overall teaching (27) act is also significant, it could be argued that this third factor reflects a generalised pattern of non-verbal type behaviour that has not yet assumed the characteristics of a methodical, planned approach to a teaching task.

10.17. Initial factor analysis on last session scores. The factor analysis on the last session scores (Table 10.2) presents a more precise picture of behaviours than do the first session scores. The first three factors, with the exception of one item, completely reflect the 'a priori' sub-scales of Verbal Specific, Voice and Speech and Non-verbal Behaviours. The one non-significant item (with a loading of .398) is that of 'fluent delivery' from the voice and speech sub-scale. Of the remaining six vectors, five contain significant specific factors. However, as with the first session scores, no contribution towards unit variance occurred after the third factor.

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[7] The level of significance used on factor loadings in this first factor analysis was ± .400. This exceeded the 95% level of significance for factor loadings as given by the Burt-Banks method. See Child (1970) for further explanation on this point.

TABLE 10.1.

THE VARIMAX FACTOR MATRIX FOR FIRST SESSION SCORES

Scale Item*	Factor 1	2	3	4	5	Communality
1	.722	-0.056	.196	.133	.048	.583
2	-0.021	.288	.492	.005	.043	.328
3	.213	-0.255	.397	.033	.109	.281
4	.646	-0.004	.232	.226	.076	.527
5	-0.035	-0.094	-0.103	.631	.002	.481
6	.149	-0.037	.502	-0.214	.402	.483
7	.921	.105	.089	-0.076	-0.098	.883
8	.764	.074	.237	-0.393	.051	.803
9	.806	-0.003	.300	-0.285	-0.037	.822
10	.897	.020	.104	-0.077	-0.089	.830
11	.842	.011	.107	-0.045	-0.139	.741
12	.796	.086	.188	-0.256	.068	.747
13	.801	.046	.292	-0.137	.110	.760
14	.886	.030	.129	.141	.035	.823
15	.885	-0.050	.050	-0.069	.189	.829
16	.888	-0.097	.010	.049	-0.015	.801
17	.559	-0.013	.440	-0.099	-0.299	.605
18	.423	.001	.631	-0.145	-0.278	.674
19	.706	.043	.298	.181	-0.148	.645
20	.261	.058	.671	-0.193	-0.112	.572
21	-0.032	.771	-0.069	-0.142	-0.027	.621
22	.055	.770	.073	-0.051	-0.002	.604
23	.012	.784	.012	-0.081	-0.096	.630
24	.150	.800	.027	.116	.116	.690
25	-0.067	.518	.305	-0.023	.199	.406
26	-0.024	.470	-0.045	.063	.494	.471
27	.398	.084	.670	.089	.053	.625
Cumulative contribution of factors to total unit variance	.329	.400	.402	.402	.402	-

*Key to the items are contained in Appendix 10-A

TABLE 10.2.

THE VARIMAX FACTOR MATRIX FOR FINAL SESSION SCORES

Scale Item	Factors									Communality
	1	2	3	4	5	6	7	8	9	10
1	.166	-0.021	.061	.808	.119	-0.040	.036	-0.001	.010	.702
2	.011	.262	.052	.208	.516	-0.011	.105	-0.109	-0.107	.417
3	.236	.150	.224	-0.009	.088	-0.198	.011	.491	-0.079	.423
4	.200	.107	.013	.384	.246	.319	-0.316	.103	-0.116	.485
5	-0.197	.123	.080	-0.051	.095	.691	-0.015	-0.137	.080	.575
6	.039	.020	.056	.007	.829	.113	-0.105	.139	.066	.739
7	.875	.049	.091	.119	-0.082	.007	-0.043	.048	.085	.809
8	.799	-0.111	.111	-0.158	.047	-0.091	-0.207	.079	.077	.752
9	.890	.057	.123	.060	-0.028	-0.028	-0.155	-0.098	-0.126	.873
10	.821	-0.013	.136	.109	.052	.082	.230	-0.036	-0.009	.769
11	.820	-0.038	.005	-0.008	.104	-0.061	.246	.064	.050	.755
12	.853	-0.004	.131	.074	.066	.100	.056	-0.092	-0.198	.816
13	.858	-0.101	.049	.085	-0.013	-0.062	.024	.081	-0.219	.815
14	.795	-0.002	.003	.180	-0.110	-0.053	-0.244	.084	-.156	.770
15	.860	-0.048	.070	.032	.149	-0.107	-0.081	-.262	.105	.868
16	.820	-0.084	.093	.222	.061	-0.071	-0.198	.077	-.239	.849
17	.105	.138	.603	.286	-0.140	.226	-.114	-.283	.112	.651
18	.036	.164	.822	.089	.058	.091	.044	-0.272	.014	.730
19	.271	.121	.497	.487	-0.017	-0.123	-0.123	-0.015	-0.158	.630
20	.229	.028	.595	-0.198	.193	-0.163	-0.113	-.240	-0.103	.592
21	-0.074	-.755	.077	.119	.121	-0.064	.075	-0.000	.045	.621
22	-0.015	.772	.136	.002	.124	.259	-.239	.063	.063	.762
23	-0.013	.736	.004	-0.045	.021	.003	-0.176	.109	.015	.604
24	.017	.849	.140	.048	.019	.025	-0.139	.026	-0.068	.768
25	.071	.398	.268	-0.105	.007	.017	.089	-0.307	-.238	.405
26	.005	.425	-0.015	-0.079	-0.025	.171	-0.020	-0.156	-.436	.431
27	.324	.141	.370	.017	.223	.116	-0.296	-0.073	-.145	.440
mulative ntribu- on of ctors to tal unit riance	.312	.432	.437	.438						

TABLE 10.3.

VARIMAX FACTOR MATRIX FOR FINAL SESSION SCORES - PROGRAMME LIMITED TO EXTRACTION OF ONLY THREE FACTORS

Scale Item	Factor 1	Factor 2	Factor 3	Communality
1	.117	-0.054	.436	.207
2	-0.031	.313	.244	.159
3	.260	.091	.258	.143
4	.225	.074	.355	.182
5	-0.214	.213	.085	.099
6	.065	.109	.236	.072
7	.857	.072	.177	.771
8	.792	-0.054	.094	.639
9	.862	.065	.202	.788
10	.778	.041	.202	.648
11	.813	-0.039	.051	.665
12	.807	.019	.243	.711
13	.836	-0.118	.172	.743
14	.799	-0.020	.129	.656
15	.881	-0.040	.177	.809
16	.825	-0.066	.231	.739
17	.064	.129	.630	.418
18	-0.025	.182	.730	.567
19	.215	.048	.700	.539
20	.178	.052	.501	.285
21	-0.049	.740	.154	.573
22	-0.036	.816	.132	.684
23	-0.091	.713	.045	.519
24	.040	.797	.215	.684
25	.039	.452	.113	.218
26	.054	.479	-0.097	.241
27	.288	.225	.386	.282
Cumulative contribution of factors to total unit variance	.320	.455	.462	

TABLE 10.4.

PROMAX OBLIQUE ROTATION ON FINAL SESSION SCORES

Scale Item	Factor 1	 2	 3
1	.0390	-.1255	.3694
2	-.0546	.2755	.1658
3	.2035	.0724	.1654
4	.1402	.0573	.2450
5	-.2061	.1719	.0867
6	.0131	.1031	.1633
7	.7936	.0779	-.0031
8	.7413	-.0364	-.0446
9	.7932	.0602	.0205
10	.7188	.0125	.0463
11	.7647	.0068	-.0949
12	.7304	-.0007	.0757
13	.7611	-.1113	.0256
14	.7450	.0031	-.0285
15	.8007	.0069	-.0044
16	.7459	-.0530	.0620
17	-.0519	-.0018	.5511
18	-.1605	.0265	.6549
19	.9762	-.0658	.5814
20	.0727	-.0274	.4153
21	-.0498	.7085	.0186
22	.0144	.7322	.0170
23	-.0667	.7007	-.0650
24	.0377	.7587	.0542
25	.0360	.4220	.0340
26	.0665	.5099	-.1723
27	.2416	.1385	.2615

10.18. Second factor analysis on last session scores. On the basis of the observation that variance accounted for by factors did not increase after the third factor in both the first and final session situation, a further factor analysis was performed on the first session scores. This further analysis was programmed to extract only three factors. The reason for this was based on the assumption that in these circumstances the factor structure may change in terms of some of the items contained within the second and third factors, and that a possible improvement in variance accounted for by the model may take place. As hypothesized, this factor analysis completely reflected the three 'a priori' sub-scales which were entitled as "Verbal Specific, Voice and Speech, and Non-verbal aspects of teacher behaviour" (Table 10.3).

10.19. Results of the oblique rotation. The orthogonal rotation of item scores by the Varimax procedure is dependent upon an assumption that there is no correlation between factors. For the overall act of teaching behaviour it seems a more realistic view of that behaviour to admit that the practice of various skill components within the overall act of teaching is to some extent correlated. As a result of the viewpoint, an oblique rotation of factor scores was carried out. As can be seen from Table 10.4, the three 'a priori' sub-scales identified by the orthogonal rotation were predominant, and in fact were identified in much neater manner.

COMMENTS ON THE FACTOR ANALYSIS

10.20. A case for factor invariance can be made for the items contained within the Verbal Specific, Voice and Speech and Non-verbal scales. It may be prudent to state that there is only an approximate establishment of factor invariance, as in the first session situation, while the flavour of the Verbal Specific, Voice and Speech, and Non-verbal sub-scales are present; the significance of other items tends to make these factors appear somewhat broader and more complex in dimension than the 'a priori' sub-scales. One could argue that given the situation where student teachers are attempting to teach a group of pupils for the first time, at the beginning of a teacher training course, the teaching behaviour practised in the very first microteaching encounter would be of a largely unstructured general behaviour type approach, and therefore the items used in the rating scales were perhaps not as appropriate to evaluate the initial teaching encounter. If this type of argument is accepted, then it appears reasonable to state that for three factors an approximate situation of factor invariance existed between initial and final session administrations of the rating items.

10.21. The failure of the 'gestalt whole' (item 27) to contribute significantly in any of the final session analysis (Tables 10.2, 10.3 and 10.4) could be explained on the basis that it is contributing an assessment based on a general teaching ability rather than on the measurement of ability in a specific task. 'Gestalt whole' was therefore considered to be an inappropriate sub-scale for the measurement instrument.

10.22. In terms of using factor analysis in an attempt to validate the five dimensions of the Monash Microteaching Inventory, there was some support for the validity of the three dimensions or sub-scales of Verbal Specific, Voice and Speech, and Non-verbal behaviour. This support is provided by the results of the three factor analyses carried out on the final session scores, as outlined in the previous paragraph. A case has already been made for explaining the general factor image of the factor analysis on first session scores.

10.23. On examining the contribution to variance of factors, as derived from the three separate analyses carried out on the final session scores, it was decided that a reduced inventory made up only of the items contained within the Verbal Specific, Voice and Speech, and Non-verbal behaviour sub-scales, would be used to make up the criterion measures for analysis of the effects of treatment variables on the subjects (Appendix 10-B).

RELIABILITY MEASURES

10.24. Internal consistency of raters over time. In a mark-remark situation over a six-month period where the five raters scored the same videotapes of subjects engaged in microteaching, the Pearson Product Moment correlation coefficient was used as an index of consistency for raters. The results:

TABLE 10.5

CORRELATION COEFFICIENTS FOR RATER CONSISTENCY

Scale	Pearson Product Moment Correlation	
	First Session	Final Session
Verbal General	.78	.71
Verbal Specific	.71	.87
Non-verbal	.89	.79
Voice and Speech	.74	.78
Gestalt Whole	.93	.70

10.25. Reliability of Rating Items. Due to the nature of the experimental variables, each microteaching session undertaken by the subjects was hypothesized to create some form of change from the previous microteaching situation. Given then that each performance of a subject would possibly be different, the use of a test-retest reliability measure could not be considered as being an accurate indication of item reliability. Furthermore, as only the first and last microteaching lessons were stored on videotape, a test-retest reliability measure using these first and final session scores would be anticipated to give an underestimate of the stability of the ratings. However, the use of other methods of estimating item reliability, such as split halves and parallel forms, etc., was considered even more inappropriate in this particular situation. By applying a test-retest measure to the first and final session scores, it can be said that the values obtained (Table 10.6) will be an underestimate of the stability of the sub-scales.

TABLE 10.6

SUB-SCALE RELIABILITY

Scale	Co-efficient of Reliability
Verbal General	.24
Non-verbal	.57
Verbal Specific	.51
Voice and Speech	.81
Gestalt Whole	.51
MonMI (Overall battery)	.59

	First Session	Final Session (a)	Final Session (b)
Contribution of common factors to total unit variance	.402	.438	.462

10.26. Given an overall MonMI reliability figure of .59 and that the amount of variance attributable to the rotated items in the factor model is .402 for the first session and .462 for the final session, then by the use of a completeness of factorization formulae (Harman, 1970, p. 19) it can be established that the percentage of the reliability variance that is accounted for by common factors within the MonMI battery is 68 per cent and 78 per cent respectively.

10.27. While factor analysis in itself does not discriminate between specific and error variance which together make up the unique variance of a test, the analysis described does support the contention that the reliability of MonMI was acceptable.

10.28. The factor analysis on the Monash Microteaching Inventory provided some validation for three aspects of teacher behaviour, a questioning interactive aspect, which has been labelled the Verbal Specific factor, a Voice and Speech factor, and a Non-verbal factor. The failure of the factor analysis model to extract any further group factors is directly attributable to the proportion of variance accounted for by factors not contained within the measuring instruments. While paying particular attention to fulfilling the criterion, i.e., to distinguish between verbal and non-verbal skills, it is possible that not enough attention was given to dimensioning other aspects of teaching behaviour, thus resulting in large unexplained variance terms. Given that teaching is an extremely complex behaviour and that the experimenters of this project attempted to measure skill components of teaching by taking into account the way in which that skill was used in the given situation, the explanation of at least 46 per cent of total variance by the three abovementioned common factors was considered acceptable. As the experimenters were not concerned with evaluating the unknown and possible infinite field of overall teacher behaviour, a substantial amount of variance due to specific and unexplained error factors is seen as inevitable. For the statistical investigation of the experimental data the three factors were validated, to some degree by the factor analysis procedure which gave a total of 20 items each to be rated on forced choice 13-point scale. These three scales were subsequently used as the criterion measure on all subjects within the experiment.

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APPENDIX 10-A

ITEM DESCRIPTION OF THE MONASH MICROTEACHING INVENTORY

Scale	Scale Number	Item
Verbal - General	1	Amount of teacher talk
	2	Quality of teacher talk
	3	Appropriate language for age group
	4	Teacher-student interaction (quality)
	5	Student-students interaction
	6	Pace of presentation
Verbal - Specific	7	Number of questions appropriate to situation (too few? too many?)
	8	Appropriateness of material for the questioning technique to the situation encountered
	9	Language and clarity of questions
	10	Variety of questions, e.g. Yes/No answers, descriptive answers, etc.
	11	Type - higher order, etc.
	12	Timing and pace of delivery of questions
	13	Pauses, waited for student responses
	14	Use of all pupils in spread and direction of questions
	15	Reinforcement of student answers
	16	Reaction - use made of student answers
Non-verbal	17	Time spent looking at pupils (instead of notes, blackboard, floor, a single pupil, etc.) (subjective estimate of time) Most of time - 7 Little time - 1
	18	Use of non-verbal cues (facial expression, proximity to pupils, pointing to pupils, aids, etc.) to help convey extra meaning or emphasize a point High use - 7 Little use - 1
	19	Percentage of teacher talk High % - 1 Low % - 7
	20	Confusion or silence (pauses, short periods of silence and confusion in which communication cannot be understood by observer) High confusion - 1 Low confusion - 7
Voice and Speech	21	Distinctness
	22	Variety
	23	Vocal projection
	24	Control of pitch
	25	Fluent delivery
	26	Posture
Gestalt Item	27	Gestalt Whole

APPENDIX 10-B

ITEM DESCRIPTION OF THE CRITERION PERFORMANCE SCALE

Sub-Scale	Scale Number	Item
Verbal - Specific	1	Number of questions appropriate to situation (too few? too many?)
	2	Appropriateness of material for the questioning technique to the situation encountered
	3	Language and clarity of questions
	4	Variety of questions, e.g. Yes/No answers, descriptive answers, etc.
	5	Type - higher order, etc.
	6	Timing and pace of delivery of questions
	7	Pauses, waited for student responses
	8	Use of all pupils in spread and direction of questions
	9	Reinforcement of student answers
	10	Reaction - use made of student answers
Voice and Speech	11	Distinctness
	12	Variety
	13	Vocal projection
	14	Control of pitch
	15	Fluent delivery
	16	Posture
Non-verbal	17	Time spent looking at pupils (instead of notes, blackboard, floor, a single pupil, etc.) (subjective estimate of time) Most of time - 7 Little time - 1
	18	Use of non-verbal cues (facial expression, proximity to pupils, pointing to pupils, aids, etc.) to help convey extra meaning or emphasize a point High use - 7 Little use - 1
	19	Percentage of teacher talk High % - 1 Low % - 7
	20	Confusion or silence (pauses, short periods of silence and confusion in which communication cannot be understood by observer) High confusion - 1 Low confusion - 7

APPENDIX 10-C

CORRELATION MATRIX - FINAL SESSION SCORES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	0	.27	.02	.44	-.06	.09	.22	-.04	.17	.22	.10	.22	.18	.27	.14	.33	.32	.15	.53	-.11	.08
2		0	.05	.23	.11	.44	-.04	-.04	.04	.06	.01	.05	.00	-.10	.03	-.03	.01	.21	.06	.10	.34
3			0	.10	-.24	.16	.25	.26	.25	.16	.28	.15	.25	.25	.35	.21	.26	.11	.20	.45	.14
4				0	.22	.30	.30	.21	.21	.17	.08	.26	.23	.26	.25	.26	.18	.06	.33	.05	.05
5					0	.15	-.15	-.18	-.22	-.06	-.19	-.05	-.23	-.16	-.23	.19	.15	.14	-.13	-.06	.11
6						0	-.01	.06	-.01	.04	.12	.07	.01	-.02	.20	.13	-.04	.10	.09	.22	.12
7							0	.73	.81	.74	.73	.71	.73	.72	.73	.75	.24	.13	.32	.19	.00
8								0	.74	.55	.62	.65	.69	.65	.79	.71	.11	.11	.15	.31	-.15
9									0	.73	.72	.81	.75	.69	.73	.73	.15	.14	.42	.27	.01
10										0	.77	.77	.72	.62	.72	.65	.24	.17	.29	.19	-.05
11											0	.75	.72	.58	.71	.65	.07	.02	.23	.17	-.08
12												0	.81	.65	.69	.66	.18	.18	.37	.25	-.08
13													0	.72	.76	.69	.14	.07	.33	.23	-.15
14														0	.76	.82	.14	.03	.33	.09	-.10
15															0	.81	.21	.08	.22	.30	-.06
16																0	.19	.09	.34	.20	-.09
17																	0	.63	.46	.35	.15
18																		0	.52	.57	.19
19																			0	.32	.18
20																				0	.03
21																					0
22																					
23																					
24																					
25																					
26																					
27																					

APPENDIX 10-C

(Continued)

CORRELATION MATRIX - FINAL SESSION SCORES

Scale Item

4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
.44	-.06	.09	.22	-.04	.17	.22	.10	.22	.18	.27	.14	.33	.32	.15	.53	-.11	.08	.02	-.10	.01	-.09	-.09	.13
.23	.11	.44	-.04	-.04	.04	.06	.01	.05	.00	-.10	.03	-.03	.01	.21	.06	.10	.34	.29	.21	.27	.23	.06	.08
.10	-.24	.16	.25	.26	.25	.16	.28	.15	.25	.25	.32	.21	.26	.11	.20	.45	.14	.16	.10	.18	.02	-.12	.12
0	.22	.30	.30	.21	.21	.17	.08	.26	.23	.26	.25	.26	.18	.06	.33	.05	.05	.09	.11	.19	-.06	.00	.24
	0	.15	-.15	-.18	-.22	-.06	-.19	-.05	-.23	-.16	-.23	-.19	.15	.14	-.13	-.06	.11	.28	.07	.08	.13	.17	.14
		0	-.01	.06	-.01	.04	.12	.07	.01	-.02	.20	.13	-.04	.10	.09	.22	.12	.13	.07	.05	-.03	.07	.26
			0	.73	.81	.74	.73	.71	.73	.72	.73	.75	.24	.13	.32	.19	.00	.04	-.10	.08	.09	.09	.35
				0	.74	.55	.62	.65	.69	.65	.79	.71	.11	.11	.15	.31	-.15	-.09	-.14	-.08	.05	-.00	.39
					0	.73	.72	.81	.75	.69	.73	.73	.15	.14	.42	.27	.01	-.01	-.05	.11	.12	-.03	.37
						0	.77	.77	.72	.62	.72	.65	.24	.17	.29	.19	-.05	.09	-.16	.00	.06	-.00	.30
							0	.75	.72	.58	.71	.65	.07	.02	.23	.17	-.08	.04	-.19	-.02	-.01	-.04	.20
								0	.81	.65	.69	.66	.18	.18	.37	.25	-.08	-.07	-.12	.03	-.06	-.06	.32
									0	.72	.76	.69	.14	.07	.33	.23	-.15	-.05	-.23	.01	-.03	-.17	.20
										0	.76	.82	.14	.03	.33	.09	-.10	-.07	-.05	.06	.01	.03	.33
											0	.81	.21	.08	.22	.30	-.06	-.03	-.08	.00	-.01	-.02	.35
												0	.19	.09	.34	.20	-.09	-.04	-.17	.01	-.01	.01	.44
													0	.63	.46	.35	.15	.27	.11	.17	.11	.08	.21
														0	.52	.57	.19	.26	.11	.31	.33	.04	.34
															0	.32	.18	.07	.06	.28	.13	-.06	.30
																0	.03	.04	.06	.13	.13	-.05	.39
																	0	.63	.60	.65	.34	.33	.09
																		0	.56	.69	.37	.33	.14
																			0	.71	.22	.37	.13
																				0	.31	.36	.24
																					0	.44	.19
																						0	.07

Key to Scale Item is contained in Appendix 10-A

CHAPTER 11

DETAILS OF A COSTING MODEL AND ITS USE IN COSTING THE MICROTEACHING PROGRAMME

LIST OF SYMBOLS

Ac - activity
Act - actual
Ad - academic
Adm - administration
Amort - amortization
Ap - applied
Av - average
Ava - available
B - basic
Br - briefing
Cap - capital (in terms of cost)
CI - control and implementation
Com - complementary
Con - construction of
D - development
Dat - data
De - design of
Dy - day
En - enabling
Eq - equipment
Er - enrolled
Ex - excess
F - facility
Fac - factor
FF - feedback facility
Fr - free
H - housing
Lia - liaison
LS - lifespan
M - material
Mai - maintenance
Max - maximum
Min - minimum
Mis - miscellaneous
Mp - manpower
MtPro - microteaching programme
MtUn - microteaching unit
N - number of
NprM - non-print material
O - operating
Oh - overheads (in terms of cost)
OM - operation and maintenance
OpC - opportunity cost
P - provision of
Pd - paid
Pk - peak
Pr - printing
PrM - printed material
Pro - programme
R - research
Rep - report
Res - resource
RP - real pupil
Rq - requirement
S - student (teacher)
Sal - salary
SAva - simultaneously available
Sch - schedule
SSt - supervisory staff
ST - support teacher
St - staff
SupAc - support activity
Sv - supervision
Sw - software
T - total
t - time
Th - throughput
TSt - technical staff
TT - test
U - usage
Un - unit
Yr - yearly (annual)
$ - cost
% - percentage of
/ - per
Σ - sum of

A glossary of acronyms (e.g., Yr. Amort. Fac.) are contained in Appendices 11A-11F.

INTRODUCTION

11.1. The design of the cost model[1] is based on a series of six modules. Five of these modules identify the main categories of inputs required for the implementation of a programme. The sixth module provides the calculations necessary to arrive at the total programme cost, cost per programme unit[2] and cost per student.

11.1.1. Enabling Resource Module (En.Res). This module identifies the costs of providing and operating the resources needed to provide a single operational programme facility.

11.1.2. Manpower Requirements Module (MpR). This identifies the costs associated with providing the manpower required to operate and maintain the programme.

11.1.3. Administrative Module (Adm.R.). This module costs the manhours and materials spent in design, planning and supporting the implementation of the programme.

11.1.4. Research and Development Module (RD). This module identifies the manpower and material requirements needed for the function of basic and applied research including material and programme development.

11.1.5. Software Module (SwR). This module costs the use of print and non-print materials used in programme operation.

11.1.6. Summarisation Module. This module uses estimates of programme completion time to arrive at overall programme costs, including costs per programme unit and per student.

DETAILS OF THE COST MODEL

ENABLING RESOURCES MODULE

11.2. This module provides the cost of the resources needed for one programme facility termed Facility X (FX).[3] The main resources required include housing (H), equipment (Eq) and furniture (Mis).

---

[1] Conceptual factors bearing on the cost model are discussed in Chapter 5, paragraphs 5.33-5.69.

[2] A programme unit is the time required for a single use of the facility by one student.

[3] For the microteaching programme FX was the resources needed to provide the necessary teach and feedback facilities for one or more student teacher using FX simultaneously.

For the microteaching programme additional enabling resources were human resources related to the provision of real pupils (RP) and supporting teachers (ST) to accompany the pupils.

11.3. In deriving cost estimates, the most commonly used time units to which enabling resource costs are apportioned is that of either the programme unit or working day. The total number of a particular resource unit[4] required for the operation of FX is determined from decisions concerning the intended daily throughput of students through FX (Dy.Th.S/FX): the peak student usage of the facility;[5] (Pk.SU/FX) and the number of resource units required for the operation of FX for use by a single student (N.Res.Un.). That is

$$\text{Res.Un.Rq} = \text{Dy.Th.S/FX} \times \text{Pk.SU/FX} \times \text{N.Res.Un.}$$

Each individual resource requirement for peak usage of FX can then be expressed in common units of cost; cost in the first instance being cost of purchase or supply (i.e., capital cost) of that resource.

$$\$\ \text{Cap. Res.} = \text{Res.Un.Rq} \times \$\ \text{Cap./Res.Un.}$$

For the reported study the peak usage factor was 1 and the number of any one particular resource unit also equalled 1.

11.4. The contribution to resource unit costs of a particular resource is calculated on the basis of time or percentage of usage of that resource used in maintaining the operational state of the resource unit.

11.5. For physical resource units, such as electronic feedback equipment or teaching rooms, the calculated cost contribution will include estimates of the proportion of both the annual amortization charge and the annual maintenance charge. In the case of human enabling resources, cost contribution is estimated where possible on a pro rata average annual salary together with any transport costs involved in providing the human resources. This method of cost allocation is based on the assumption that the resource has multi-mission capability beyond that of the intended programme. If the multi-mission assumption is invalid, then the total cost of the resource should be attributed to the resource unit.

---

[4] Resource Unit. A resource unit represents all the items necessary for that resource to be considered operational in FX. In the microteaching programme a CCTV unit comprised a camera, VTR, monitor, cables, etc.

[5] Peak student usage is expressed as ratio of the number of students who simultaneously use the facility to the intended daily throughput.

11.6. Depending on the data available from historical records and provided by estimates, there is a number of ways of calculating SDY.FX. In all cases the starting point for the calculation is either the capital cost (\$.Cap.) of the resource, or supply cost in terms of salaries foregone. This is then the actual initial cost of ensuring that the resource is available for the programme. For example:

1. Given an annual amortization[6] (Yr Amort) and maintenance (Mai) factor or charge for any single resource

$$\text{\$Yr Amort}\,[7] = \text{\$Cap} \times \text{Yr.Amort.Fac.}$$

$$\text{\$Yr} = \text{\$Yr.Amort} + \text{\$Yr.Mai}$$

$$\text{\$Dy}\,[8] = \frac{\text{\$Yr}}{\text{N.Dy.Ad.Yr.}}$$

$$\text{\$Dy.FX} = \frac{\text{\$Dy}}{\text{Dy.U.FX}}\,[9]$$

2. Where the percentage of the resource's total time that can be attributed to the programme is known

$$\text{\$YrP} = \text{\$Yr} \times \text{\% Yr Pro}$$

$$\text{\$Dy} = \frac{\text{\$Pro}}{\text{N.Dy.Pro}} \qquad \text{\$Dy.FX} = \frac{\text{\$Dy}}{\text{Dy.U.FX}}$$

---

[6] The amortization factor can be derived from figures given by such bodies as the Taxation Department or can be calculated as follows:

$$\text{Yr.Amort.Fac.} = \frac{1 + 1/2 \times i \times (L - f - Y)}{(L - f - Y)}$$

where I = internal rate on borrowed capital (L - f - Y) = lifetime of resource in years.

[7] A glossary of acronyms is given in Appendix 11-A.

[8] The actual or average daily cost of having the resource available depends upon the "annual operational period" of the institution. In the reported study

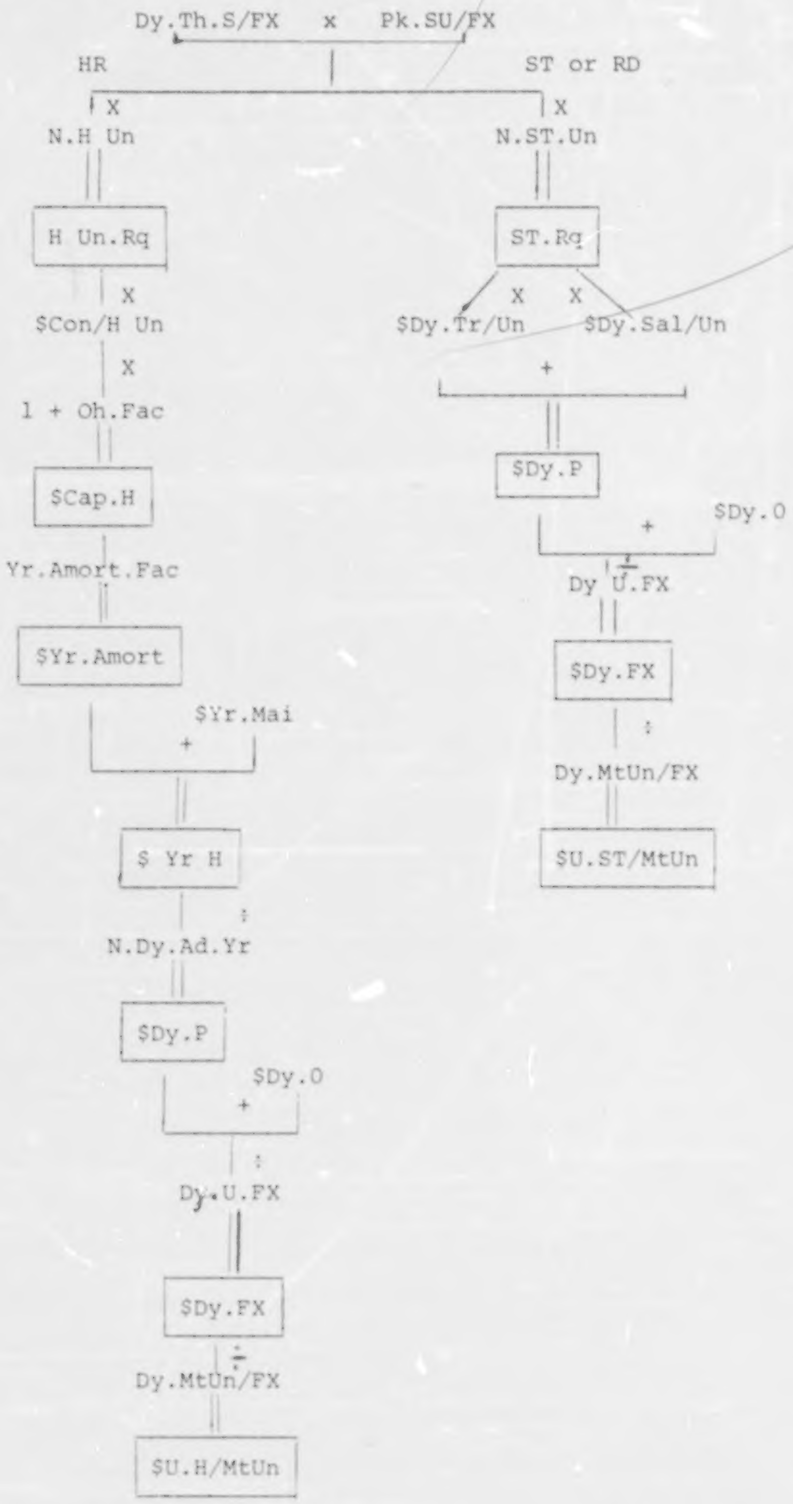
$$\text{\$Dy} = \frac{\text{component cost per year}}{\text{(38 weeks x 5 days per week)}}$$

[9] In the reported study the daily usage in FX of a resource was calculated to be 24 students x 15 minutes per student = 360 minutes

FIG. 11.1

ENABLING RESOURCES COSTING MODULE

Section 1: Housing and Manpower


Dy.Th.S/FX
x
Pk.SU/FX
HR
ST or RD
X
N.H Un
H Un.Rq
X
$Con/H Un
X
1 + Oh.Fac
$Cap.H
Yr.Amort.Fac
$Yr.Amort
$Yr.Mai
+
$ Yr H
÷
N.Dy.Ad.Yr
$Dy.P
$Dy.O
+
÷
Dy.U.FX
$Dy.FX
÷
Dy.MtUn/FX
$U.H/MtUn
X
N.ST.Un
ST.Rq
X
X
$Dy.Tr/Un
$Dy.Sal/Un
+
$Dy.P
$Dy.O
+
÷
Dy U.FX
$Dy.FX
÷
Dy.MtUn/FX
$U.ST/MtUn

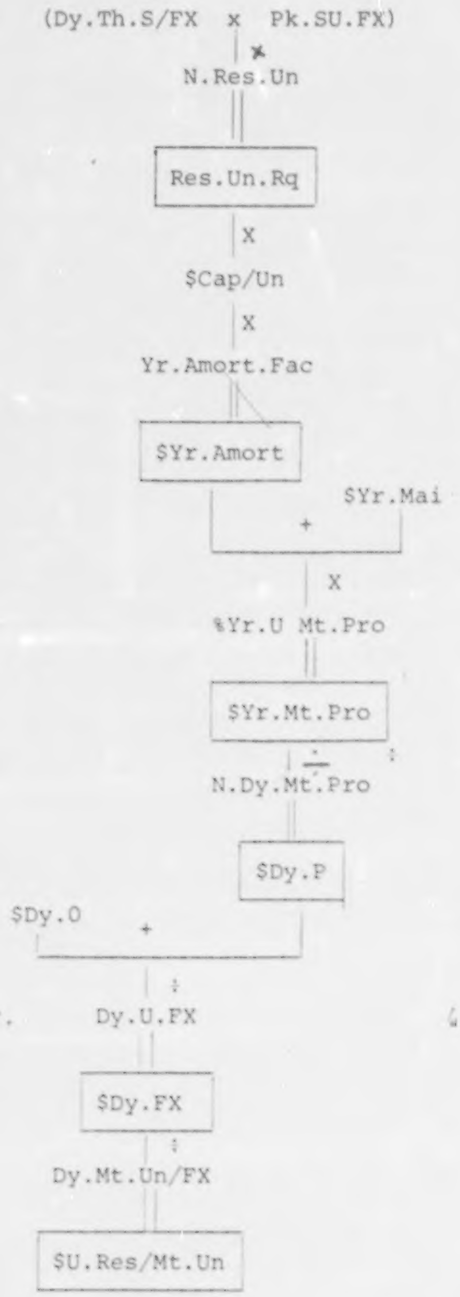
NOTE: A glossary of acronyms is provided in Appendix 11-A.

FIG. 11.2

ENABLING RESOURCES COSTING MODULE

Section 2: Feedback Equipment and Miscellaneous

Eq or Mis are substituted for Res in the following costing


(Dy.Th.S/FX x Pk.SU.FX)
x
N.Res.Un
Res.Un.Rq
X
$Cap/Un
X
Yr.Amort.Fac
$Yr.Amort
$Yr.Mai
+
X
%Yr.U Mt.Pro
$Yr.Mt.Pro
÷
N.Dy.Mt.Pro
$Dy.P
$Dy.O
+
÷
Dy.U.FX
$Dy.FX
÷
Dy.Mt.Un/FX
$U.Res/Mt.Un

NOTE: A Glossary of acronyms is provided in Appendix 11-A.

3. Where the "capital" cost of providing the resource is given as either

(a) a total cost to the programme

$$\$Dy.P = \frac{\$Cap.}{N.Dy.Pro}$$

(b) a daily cost to the programme

$$\$Dy.P. = \$Dy.FX$$

11.7. Having calculated the daily charge to the programme for the provision of a particular resource, this value can then be reduced to a cost per programme unit.

$$\$P\ (Res)/Pro.Un = \frac{\$Dy.P}{Dy.Pro.Un/FX}$$

11.8. In some cases an additional operating cost ($0 Res) may have to be added to obtain a total cost chargeable for the use of the resource per programme unit.

$$\$U\ Res/Pro.Un = \$P.Res/Pro.Un + \$0.Res/Pro.Un$$

11.9. To obtain a cost per student the daily cost per programme unit can be divided by the peak usage factor.

11.10. The model assumes that, if two or more resource units are used, they are identical in cost structure to the first resource unit. If, however, resource units differ in cost structure then each unit would be costed separately and added on at the various linkage points in the model to the costs of other resources to gain overall cost estimate. The same applies with duplication of FX.

11.11. For the current programme five sub-components of the enabling resource module were identified

(a) Housing requirement (H)
(b) Real pupil requirement (RP)
(c) Supporting teacher requirement (ST)
(d) Feedback facility (FF)
(e) Miscellaneous (Mis)

Costs for each resource unit within each sub-component was calculated and then a total sub-component cost derived. Sub-component costs were then summed to give a total cost of providing the enabling resource per FX for a microteaching unit.[10] The actual costing plan used in deriving costs for this module is given in Figures 11.1 and 11.2.

---

[10] A microteaching unit is equivalent to the use of one FX to provide one teach feedback cycle to one student teacher.

11.12. Housing Requirement (H). There were nine inputs required to enable the cost of the housing resource component of FX to be calculated. Six of these inputs came from outside the programme.

(a) Building construction costs ($Con)
(b) Annual amortization factor (Yr.Amort.Fac)
(c) Housing overhead factor (Oh)
(d) Annual cost of maintenance ($Yr.Mai)
(e) Estimated daily operating costs (e.g., electricity charge) ($Dy.O)
(f) Number of days in the academic year (N.Dy.Ad.Yr)

The remaining three inputs arose from programme planning decisions:

(a) Total housing requirement for FX (H.Un.Rq)
(b) Daily student teacher throughput per facility for microteaching (Dy.Th S/FX)
(c) The peak usage ratio of student teachers simultaneously using the facility (Pk.Su/FX)

The calculations used to arrive at the total cost of the housing component for the reported study are given in col. HRq. Fig. 11.1.

11.13. Real Pupil Requirement (RP). Costing for the provision of real pupils was based on an estimated daily management cost. In costing real pupils in the reported study a unit was defined as the total number of pupils required to provide a microclass. This value was 6. The calculations used in deriving real pupil costs are shown in col. RP. Fig. 11.1. Also for the reported study no opportunity cost concept was used.

11.14. Supporting Teacher Requirement (ST). Supporting teachers are those teachers who accompany the real pupil to the programme. In the reported study an estimated total cost was based on the number of ST required by the school to accompany the pupils and the number of days over which the microteaching programme was to operate. Calculations used to derive the cost per microteaching unit are shown in col. ST. Fig. 11.1.

11.15. Feedback Facilities (FF). The feedback facilities relate to the equipment required to assist the supervisor in the provision of feedback to the student teachers. As with the housing component, a number of costing inputs had to be obtained from outside the programme. These included:

11.15.1. The initial capital cost of the equipment ($Cap).

11.15.2. The annual amortization factor (Yr.Amort.Fac.).

11.15.3. The annual maintenance charge ($Yr.Mai). For equipment this can be costed on either an annual contract basis or an estimated annual service and repair cost basis.

Note: The costs used in this report were based on those charged by the University AVA Department and so may underestimate the real costs of the maintenance system.

11.15.4. Total annual usage of the equipment expressed in time units The other input, i.e., total number of equipment items required for peak usage of FX, was derived from programme planning.

11.16. The calculations required for deriving the cost per microteaching unit are shown in col. Eq., Fig. 11.2.

11.17. Miscellaneous Requirements (Mis.). This sub-component provides costs related to furniture required as an FX resource. As with all other sub-components, miscellaneous requirements were costed on the basis of units of equipment required.

11.18. Within each sub-component the summary of the costing for each individual resource unit provides a total costing for that sub-component. Given these sub-component costs, various total enabling resource costs can be calculated.

(a) Daily cost of providing enabling resources for Facility X

$$\$T.Dy.P.En.Res/FX \quad \Sigma\$Dy.P.H + \Sigma\$Dy.P.ST + \Sigma\$Dy.P.\ P.RP + \Sigma\$Dy.D.Eq + \Sigma\$Dy.P.Mis.$$

(b) Total cost of enabling resources per programme unit

$$\$T.En.Res/Pro.Un = \$T.H/Pro.Un + \$T.ST/Pro.Un + \$T.RP/Pro.Un. + \$T.Eq./Pro.Un + \$T.Mis/Pro.Un.$$

where \$T.H/Pro.Un. is the total usage costs (\$U) for housing and \$T.ST/Pro.Un. the total usage costs for support teachers, etc.

MANPOWER MODULE

11.19. In the generalised model the manpower module provides costing estimates for the use of staff required to operate equipment or instruct the students.

11.20. Inputs required to enable calculations of manpower costs per programme unit include

11.20.1. The number of students to use the facility daily (Dy.Th.S/FX).

11.20.2. The ratio of students to staff in the teaching function. This is similar to Pk.SU. In a microteaching programme depending upon usage of teacher time, this ratio may not be the same as the total number of teachers employed divided by the total number of students.

11.20.3. Percentage of staff members' time spent on complementary activities outside of daily paid for time (1 + % Dy.Fr.t.). From an accounting point of view, the cost of manpower could be calculated by multiplying the number of required manpower time units by the average cost per time unit. However, with reference to inherited resource items, the number of manpower time units needed to fulfil the programme requirements need to take into account the utilization of existing resources and the free contribution of man hours if they occur. That is 1 + % Dy.Fr.t attaches an estimate of unpaid for time used and associates an imputed cost to that time.

11.20.4. Percentage of the staff members' time spent in the programme on complementary activities such as administration and preparation (1 + % Com.t.). This value is useful in terms of a planning device to distinguish between time actually spent on contact supervision and time spent in preparation and/or administration required to support the supervisory task.

11.20.5. Total units of a staff member's daily time available for the programme (Ava.t.Dy.).

11.20.6. Salary for staff member per programme unit.

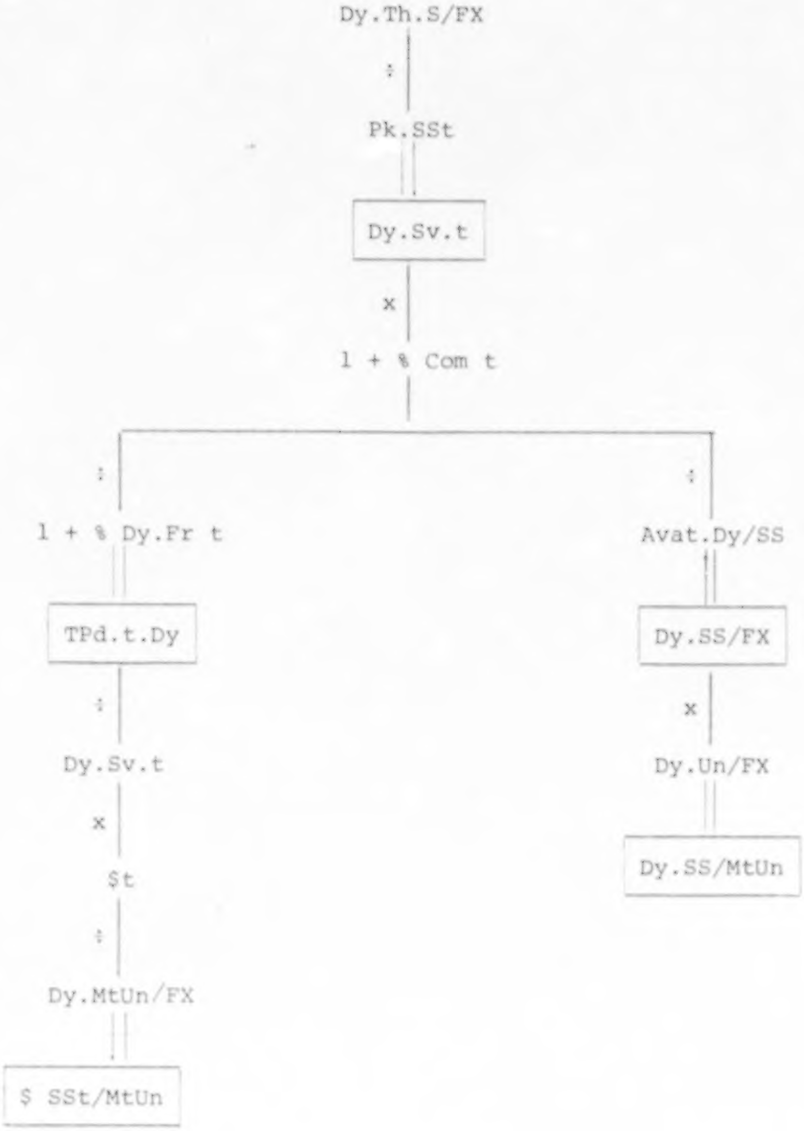
11.21. For the microteaching programme, the manpower module was seen as comprising two sub-components

11.21.1. Supervisory staff (SSt) - that is the staff employed to observe the microlesson and provide feedback to the student teacher.

11.21.2. Technical staff (TSt) - staff required to operate and maintain the equipment used in the teach-feedback cycle.

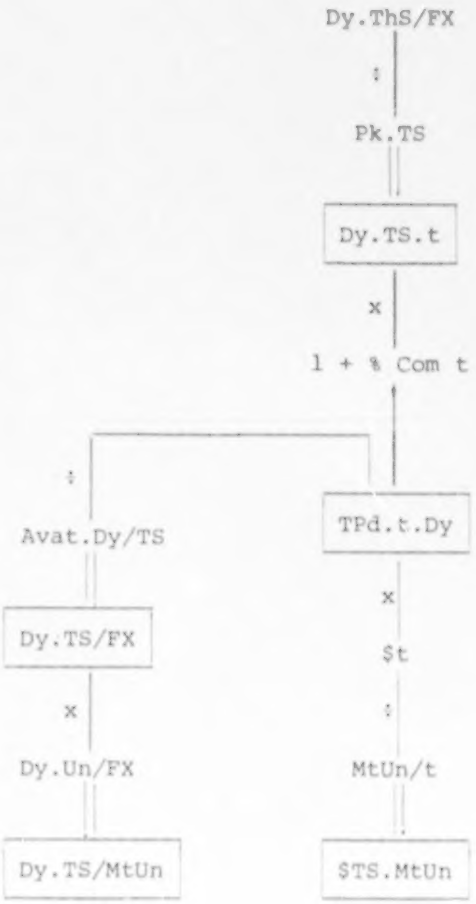
11.22. In the reported costing, Fig. 11.3, the percentage of forced complementary time (1 + % com. t) was zero as a full-time administrator handled all complementary duties. As the reported programme was designed so that no teacher's free time was used (Dy.Fr.t) this value was also zero. This meant that the total units of teacher time available for the performance of all required duties in connection with the programme was equal to the total number of time units spent supervising (Dy.Sv.t). For the programme a value of $1.11 was an average of the salaries cost per unit of time of the supervisory staff involved in the project (1972 estimates).

FIG. 11.3 SUPERVISORY COSTING MODULE


Dy.Th.S/FX
÷
Pk.SSt
Dy.Sv.t
x
1 + % Com t
÷
1 + % Dy.Fr t
TPd.t.Dy
÷
Dy.Sv.t
x
$t
÷
Dy.MtUn/FX
$ SSt/MtUn
÷
Avat.Dy/SS
Dy.SS/FX
x
Dy.Un/FX
Dy.SS/MtUn

NOTE: A glossary of acronyms is provided in Appendix 11-B.

FIG. 11.4. TECHNICAL STAFF COSTING MODULE


Dy.ThS/FX
÷
Pk.TS
Dy.TS.t
x
1 + % Com t
÷
Avat.Dy/TS
TPd.t.Dy
Dy.TS/FX
x
$t
x
÷
Dy.Un/FX
MtUn/t
Dy.TS/MtUn
$TS.MtUn

NOTE: A glossary of acronyms is provided in Appendix 11-B.

11.23. In the costing for technical staff (Fig. 11.4), complementary duties included setting up and breaking down time. A value of 98¢ was the average salary per unit of programme time (1972 estimates).

ADMINISTRATIVE MODULE

11.24. The administrative module has two main sub-components - staff and materials.

11.25. In the case of staff, the assumption is made that no personnel will be fully employed annually on administrative tasks related solely to a particular programme. In arriving at costs associated with staff usage, the following information is required:

(a) Number of time units required for programme design and scheduling

(b) Number of time units required for liaison with other departments and/or institutions

(c) Number of time units required for control and implementation

(d) Number of time units required for staff briefing.

11.26. If it is considered necessary to provide an in-service training course for the preparation of supervisory staff, then this cost is included in the administration module. To establish such costs the following additional information is required:

(a) Number of supervisors per training session

(b) Number of time units required for training sessions

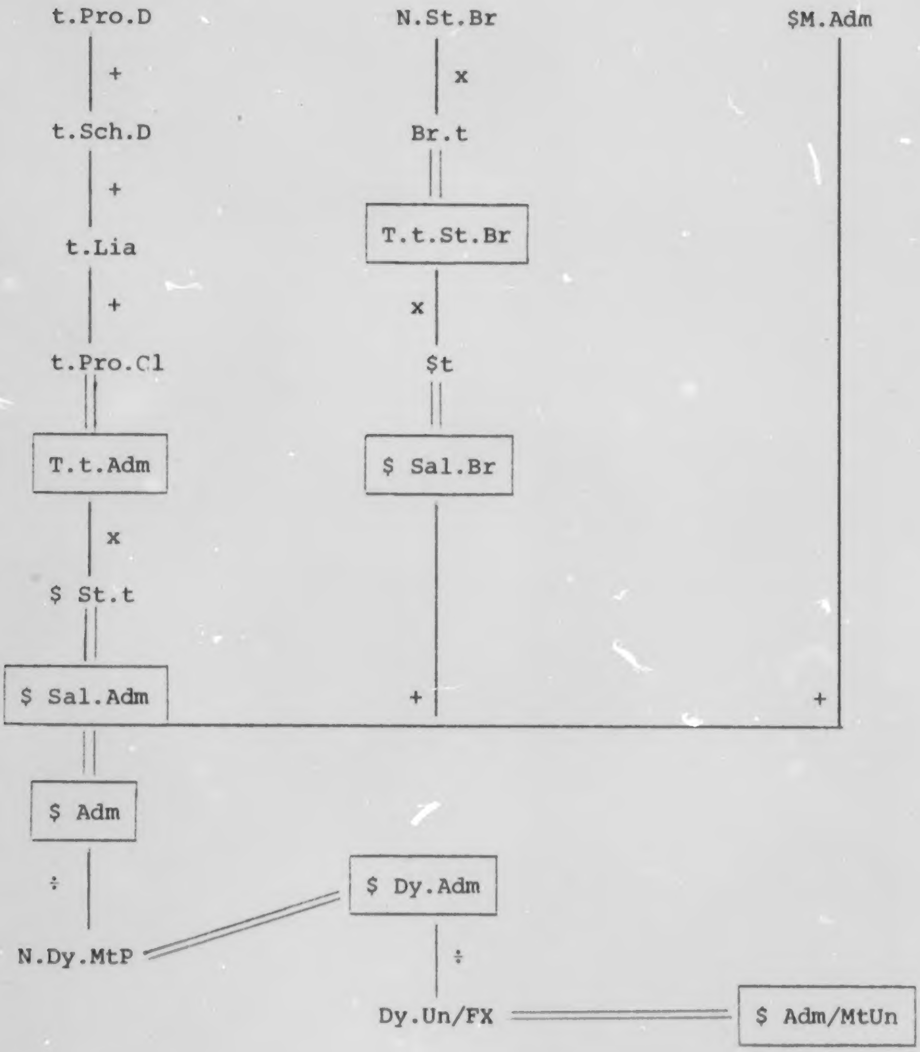
(c) Cost per supervisor time unit

These values can be provided by estimates in the case of a pre-programme costing, or some may be available as actual costs in a post-programme costing.

11.27. Material Sub-component. Due to the wide variety and quantity of materials that could be required for supporting the administrator, this element is given as a simple total cost which in most instances would be an estimate of the value of the materials used.

11.28. The actual costing model used in the reported case is in Fig. 11.5.

FIG. 11.5. ADMINISTRATIVE COSTING MODULE


t.Pro.D
+
t.Sch.D
+
t.Lia
+
t.Pro.Cl
T.t.Adm
x
$ St.t
$ Sal.Adm
$ Adm
÷
N.Dy.MtP
N.St.Br
x
Br.t
T.t.St.Br
x
$t
$ Sal.Br
+
$ Dy.Adm
÷
Dy.Un/FX
$ Adm/MtUn
$M.Adm
+

NOTE: A glossary of acronyms is provided in Appendix 11-C.

RESEARCH AND DEVELOPMENT MODULE

11,29. The costing of the research and development component for a programme becomes a rather complex issue when the research and development staff are also engaged on other programmes. This makes the apportion of time and wages of research and development staff to a particular project difficult.

11.30. Other problem areas to emerge when costing the research and development function are:

11.30.1. The allocation of costs of materials to a research and development project, when those materials have a life beyond the particular project in question, and are useful in the pursuance of other research and development projects.

11.30.2. The allocation of research and development costs over time, especially when the product of research and development may be longlasting (i.e., beyond the period in which research and development costs were incurred).

11.31. In order to simplify procedures, it is assumed that research and development costs are entered to the particular period that can be directly related to supporting a particular programme.

11.32. If research and development is an ongoing function despite the timing of the microteaching programme, then research and development costs should be debited to the accounting period within which they are incurred. This view is one that is associated with conventional accounting procedures. However, if one costs from a 'project costing' point of view so that the time period is not tied to conventional discreet annual periods, a more meaningful spread of research and development costs may result.[11]

11.33. In developing the reported model there were considered to be three different research and development activities involving both personnel and material costs to be considered.

11.33.1. Costs associated with basic research. For many institutions involvement in basic research such as the identification and validation of teaching behaviours or the effects of massed or distributed feedback, would not be seen as a necessary part of the proposed programme and so no costs would be associated with this element.

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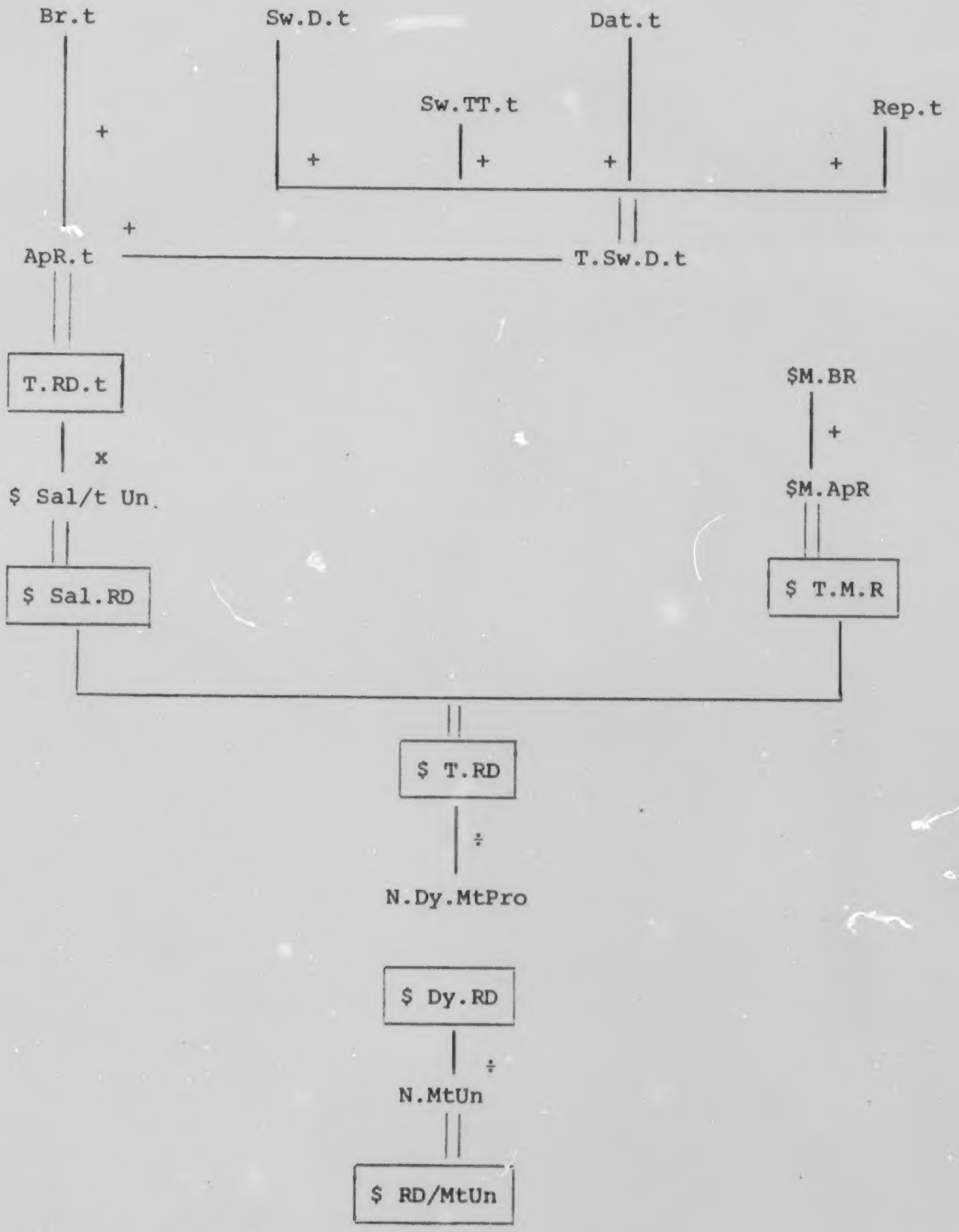
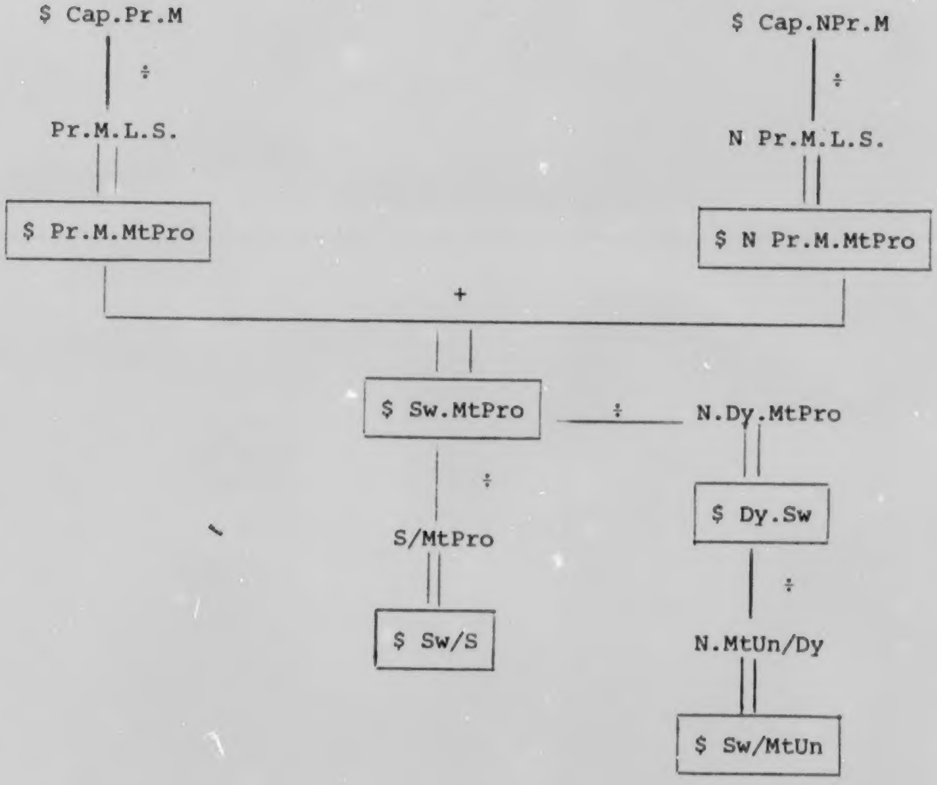
[11] A more detailed discussion of research and development is provided in Chapter 6, paragraph 6.16.

FIG. 11.6. RESEARCH AND DEVELOPMENT COSTING MODULE


Br.t
Sw.D.t
Dat.t
Sw.TT.t
Rep.t
+
+
+
+
+
+
ApR.t
T.Sw.D.t
T.RD.t
x
$ Sal/t Un.
$ Sal.RD
$M.BR
+
$M.ApR
$ T.M.R
$ T.RD
÷
N.Dy.MtPro
$ Dy.RD
÷
N.MtUn
$ RD/MtUn

NOTE: A glossary of acronyms is provided in Appendix 11-D.

FIG. 11.7. SOFTWARE COSTING MODULE


$ Cap.Pr.M
÷
Pr.M.L.S.
$ Pr.M.MtPro
$ Cap.NPr.M
÷
N Pr.M.L.S.
$ N Pr.M.MtPro
+
$ Sw.MtPro
÷
N.Dy.MtPro
÷
S/MtPro
$ Sw/S
$ Dy.Sw
÷
N.MtUn/Dy
$ Sw/MtUn

NOTE: A glossary of acronyms is provided in Appendix 11-E.

11.33.2. Costs associated with applied research. This can be broadly defined as the application to a particular programme of the knowledge resulting from basic research.

11.33.3. Costs associated with the development of software for use within the programme.

11.34. In the reported study the costing of personnel across all three activities was considered as one element, while the cost associated with the use of materials was considered as a separate element. The costing model used is shown in Fig. 11.6.

SOFTWARE MODULE

11.35. This module is concerned with establishing the total cost and cost per programme unit of print and non-print materials used in the teaching of the student teachers participating in the programme. Print materials may be either purchased manuals or roneo material prepared within the institution. Non-print materials refers to videotape, films, audiotapes, etc.

11.36. Print materials can take the form of commercially produced books, manuals or learning packages, or may be self-developed. If the software support is self-developed, the capital cost is a summation of the costs of typists' time, stencils, paper, printing and distribution. The capital costs of print material are partly a fixed cost and partly a variable cost, with typing and stencils being the fixed cost component, and paper, printing and distribution being variable costs.

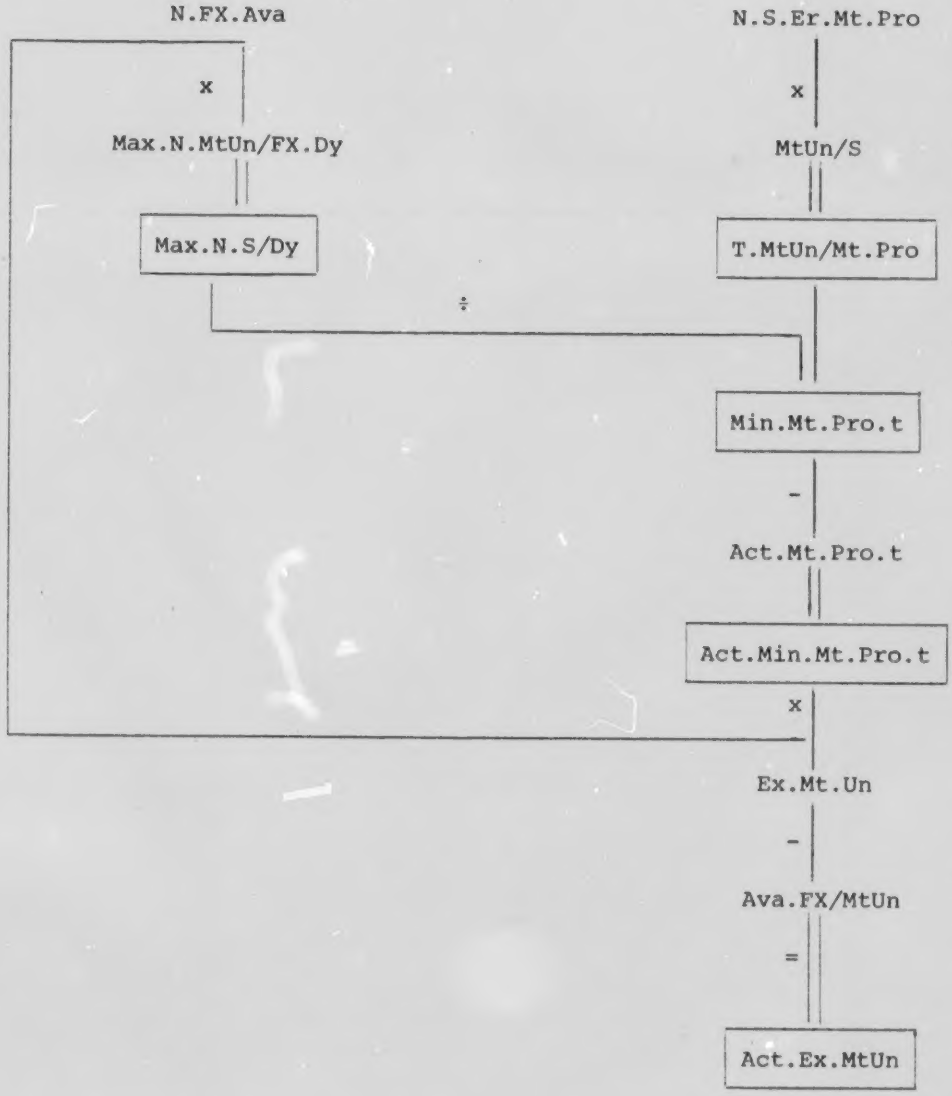
11.37. If the software component is a purchased commercial item re-usable over a number of programmes, then some estimate of life needs to be made and the initial purchase cost amortized over that period. However, where the software is for use in the one programme and not considered re-usable, then it becomes a total charge to that programme.

11.38. In the reported study the print material was given to the student teachers and not considered re-usable in later programmes. Non-print material was considered re-usable. The actual costing model used is shown in Fig. 11.7.

SUMMARISATION MODULE

11.39. This module differs from the other five modules in that it uses data from those models as well as estimates from programme planning to compute total programme costs, costs per FX, costs per programme unit and costs per student.

FIG. 11.8. CALCULATION OF PROGRAMME TIME


N.FX.Ava
x
Max.N.MtUn/FX.Dy
Max.N.S/Dy
N.S.Er.Mt.Pro
x
MtUn/S
T.MtUn/Mt.Pro
÷
Min.Mt.Pro.t
-
Act.Mt.Pro.t
Act.Min.Mt.Pro.t
x
Ex.Mt.Un
-
Ava.FX/MtUn
=
Act.Ex.MtUn

NOTE: A glossary of acronyms is provided in Appendix 11-F.

11.40. Values from the other modules are provided either as the total daily cost of providing FX or as the cost per programme unit. Before final costs can be calculated the following information is required:

(a) Total number of students enrolled in the programme

(b) The number of cycles required to be completed by each student

(c) The number of FXs available.

11.41. For any programme there is a theoretical minimum time required for its successful completion. In planning it is important that any time estimates for programme completion either equal the minimum theoretical time or exceed it. Where the estimate time is greater than the theoretical minimum, the difference in time units will be seen as an excess (Fig. 11.8).

11.42. A number of possible summarisation calculations would be:

11.42.1. Total cost of a programme unit

$$\text{\$T.Pro.Un} = \text{\$ En.Res/Pro.Un} + \text{\$Mp/Pro.Un} + \text{\$Adm/Pro.Un} + \text{\$Sw/Pro.Un} + \text{\$RD/Pro.Un.}$$

11.42.2. Total cost of support activities per programme unit

$$\text{\$T.Sup.Ac/Pro.Un} = \text{\$Adm/Pro.Un} + \text{\$RD/Pro.Un.}$$

11.42.3. Total cost of Facility X resources to the programme

$$\text{\$T.FX.Pro} = \text{\$.En.Res/FX} + \text{\$.Mp/FX} + \text{\$.Sw/FX}$$

11.42.4. Total programme cost

$$\text{\$T.Pro} = \text{\$T.Pro.Un} \times \text{N.Pro.Un/Pro}$$

11.42.5. Total cost per student entering the programme

$$\text{\$/S} = \text{\$T.Pro} \div \text{N.S.}$$

11.43. From the above calculated values it is possible to calculate the proportion of total costs due to each cost module. It is also possible to calculate the cost effect of increasing student throughput per facility and the relative economics of increasing the number of available facilities.

APPENDIX 11-A

GLOSSARY OF ACRONYMS FOR ENABLING RESOURCE MODULE

NOTE: The acronym provides for the general model so that when used in coding a specific resource or programme the general symbols indicated by being placed in brackets have to be replaced by the more specific, e.g.,

(Pro Un) - programme unit becomes MtU - microteaching unit
(Res) - resource becomes Eq - equipment, H - housing, etc.

Dy.(Pro Un) FX - *Daily (programme units) per FX.*
The scheduled number of programme units (i.e., microteaching cycles) per day.

Dy.Th.S/FX - *Daily throughput of students per FX.*
The administrator determines, in the light of environmental factors and programme time schedules the daily flow of students through FX.

Dy.U.FX - *Daily usage of FX.*
The daily usage in time units of FX scheduled for in the programme.
Daily usage = daily student throughput x time in programme per student.

N.Dy.Ad.Yr - *Number of working days in the academic year.*

N.Dy.(Pro) - *Number of working days scheduled for the (programme).*

N.(Res.)Un - *Number of Resource Units.*
The number of a particular resource unit required for the operation of FX for a peak student usage of 1.

OH Fac - *Overhead housing factor.*
Ratio of indirectly used housing such as stairs, lifts, etc. to cost of directly used housing such as classrooms.

Pk.SU.FX - *Peak student usage of FX.*
This is the ratio between the highest number of students using FX simultaneously and the total number of students to pass through FX daily.

Res.Un.Rq - *Resource Unit Requirement.*
The total number of a particular resource unit required for the full operation of FX.

Yr.Amort.Fac - *Yearly amortization factor.* This is the annual amortization factor for the capital value of the resource (see footnote 6, p. 147).

%Yr.U.(pro) - *Percentage (%) of yearly usage attributable to the (programme).*

$Cap(Res) - *Capital costs ($) of Resource.* Costs associated with the initial supply of the required number of resource units.

$Cap./(Res.Un) - *Capital costs ($) per resource unit.* Costs associated with the initial supply of a single resource unit.

$Con/H.Un - *Cost ($) of construction per housing unit*

$Dy.FX - *Daily cost ($) attributed to FX.* The actual proportion of the daily cost of having the resource available that can be charged to its use in FX.

$Dy.O - *Cost ($) daily of operating the resource* These costs include such things as supply of electricity and so may be estimated or actual.

$Dy.P - *Cost ($) of daily providing the resource.*

$U(Res)/Pro.Un - *Cost ($) of usage of (resource) per (programme unit).* The total cost of usage of a resource is the sum of the costs of providing and operating the resource.

$Sal/Un/Dy - *Cost ($) of salaries per unit per day.* Cost of salaries of the support staff.

$Tr/Dy - *Cost ($) of transport per day.* Cost of transporting support staff to the programme.

$Yr.Amort - *Yearly amortization cost ($)* (See Yr. Amort. Fac)

$Yr.Mai - *Yearly (i.e., annual) cost ($) of maintenance of the resource.*

$Yr.Pro - *Yearly cost ($) of providing the (programme).* This is the cost per year of providing the programme and does not include operating costs.

$Yr.Res - *Yearly cost ($) of the resource.*

APPENDIX 11-B

GLOSSARY OF ACRONYMS FOR MANPOWER MODULE

NOTE: The acronym provides for the general model so that when used in coding a specific resource or programme the general symbols have to be replaced by the more specific, e.g.,

Pro.Un - programme unit - becomes MtUn - Microteaching unit.

Mp - manpower - becomes SSt - supervising staff
TSt - technical staff

Ava.t.Dy/SSt - *Available time daily per supervisor staff.* The total time units per day that a supervisor can spend contributing to the programme.

Ava.t.Dy/TSt - As above but for technical staff.

Dy.(Mp)/FX - *Daily (manpower) required per FX.* The manpower required daily to maintain one programme facility.

Dy.(Mp)/(Pro.Un) - *Daily (manpower) per (programme unit).* Daily (manpower) requirement to maintain a programme unit.

Dy.Sv.t - *Daily supervising time.* The total time units spent by all supervisors in supervising the programme for one FX.

Dy.Th.S/FX - *Daily throughput of students per FX.* The administrator determines in the light of environmental factors and programme time schedules the daily flow of students through FX.

Dy.TSt.t - *Daily technical staff time.* Total time units spent by all technical staff in operating the equipment for FX.

Dy.(Pro.)Un/FX - *Daily (programme) units per FX.* The scheduled number of programme units per facility per day.

Pk(Mp).Rq - *Peak (manpower) requirement.*
Manpower required to meet peak usage of FX.

N(Pro.Un)/t - *Number of programme units per time unit.*

TPd.t.Dy - *Total paid time daily.*
This is the number of paid for staff time units per working day per FX.

1 + %com. t - *One (1) plus percentage of complementary time.*
This is the percentage of supervisor time spent on 'forced complementary' activities such as instruction, preparation, administration, etc.

1 + %Dy.Frt - *One (1) plus percentage of daily free time.*
Percentage of time beyond the required paid for work day that the teacher is willing to, or spends on forced complementary activities.

$(Mp)/(Pro.Un) - *Cost($)of (manpower) per (programme unit).*

$t - *Cost ($) per time unit.*
This is the cost of salary, benefits and related overheads, per unit of paid manpower time.

APPENDIX 11-C

GLOSSARY OF ACRONYMS FOR ADMINISTRATIVE MODULE

Br.t - *Briefing time.*
Time spent on briefing staff as to programme objectives and their role in the programme.

Dy.Un/FX - *Daily programme unit per FX*
The scheduled number of programme units per day.

N.Dy.(Pro) - *Number of days required for (programme)*

N.St.Br - *Number of staff attending briefing.*

t.Lia - *Time to be spent on liaison tasks.*

t.Pro.CI - *Time to be spent on programme control and implementation.*
The time required for programme control once the programme is operating.

t.Pro.De - *Time to be spent on programme design.*
The estimated number of time units that will be required for programme design.

t.Sch.De - *Time to be spent on schedule design.*
The estimated number of time units that will be required for the preparation of throughput schedules.

T.t.St.Br - *Total time units required for staff briefing.*

T.t.Adm - *Total time units required for administrative support.*
The total time units needed to perform the administrative function in order to support the programme.

$Adm - *Cost ($) of administration.*
Total cost to programme of the administration.

$M.Adm - *Cost ($) of materials used in administration.*
Total cost of materials used up in the administrative process.

$Sal.Adm - *Cost ($) of salary to administer programme.*
The total cost of salaries and related overheads for the number of time units required for programme administration.

$Sal.Br - *Cost ($) of salary due to briefing.*

$/St.t - *Cost ($) per unit of staff time*
The cost of salary and related overhead per unit of paid administrative time. If spread out over a number of personnel then this figure should represent an average of those costs.

$/t - *Cost ($) per time unit*
Cost of salary per time unit.

$T.Sal.Adm. - *Total salary costs ($) for administration.*

APPENDIX 11-D

GLOSSARY OF ACRONYMS
FOR RESEARCH AND DEVELOPMENT MODULE

B.R.t	*Basic research time.* The number of total time units.
Ap.R.t	*Applied Research time.* The total number of time units spent by research personnel on the applied research function.
Sw.D.t	*Software development time.* The number of time units that are spent on software writing and development.
Sw.TT.t	*Software testing time.* The number of time units spent on field testing software and format components of the microteaching technique.
Dat.t.	*Data time.* The number of time units spent on data collecting and analysis. If a research function is seen as part of a programme, then the time spent in collecting and analyzing data from the actual programme will be considered as part of this entry.
Rep.t	*Report time.* The number of time units taken up by research staff in reporting the results of their research.
T.Sw.D.t	*Total software development time.* Total number of time units spent by research staff on the development of materials and ideas. Development tasks are seen as those which systematically use scientific knowledge and procedures towards the production of useful materials, methods and processes.
T.RD.t	*Total research and development time.* The total number of time units spent on research and development for the envisaged programme. This is the total number of time units for all personnel, who have contributed time to the research and development function.

$Sal/t.Un - *Cost ($) of salary per time unit.*
The cost per time unit of research and development in terms of wages benefit, etc., paid to research and development staff. If a number of research personnel is involved, either an average figure of cost per time unit can be calculated or each rate for each worker and the number of time units he has worked can be used as the base for calculation.

$Sal.R.D - *Cost ($) of salaries for research and development.*
The total cost of salaries, benefits, etc., paid to research workers for the total amount of time devoted to research and development directly related to the microteaching programme.

$M.B.R. - *Cost ($) of material for basic research.*
The cost of materials consumed during the basic research function that can be directly related to the microteaching programme. Materials would include such items as stationery, computer time, books, journals and equipment such as television equipment, which would be pro-rated for the particular period in which they were used.

$M.Ap.R - *Cost ($) of materials for applied research.*
The cost of materials consumed during the applied research phase.

$T.M.R - *Total cost ($) of materials for research*
Total cost of materials consumed during the programme development phase.

$T.R.D - *Total cost ($) of research and development.*
The total research and development costs that can be directly attributed to supporting the envisaged programme.

N.Dy.Pro - *Number of days scheduled for the programme.*

$Dy.R.D - *Daily cost ($) of research and development.*

N.Pro.Un/Dy - *Number of programme units per day*

$R.D/Pro.Un - *Cost ($) of research and development per programme unit.*

APPENDIX 11-E

GLOSSARY OF ACRONYMS FOR SOFTWARE MODULE

NPr.M.L.S. - *Non-print material life span.*

Pr.M.L.S. - *Printed material life span.*

S/Pro - *Students enrolled per programme.*

S/Pro.Un - *Students per programme unit.*

$CapNPr.M - *Capital cost ($) of non-print materials.*
Non-print material would include film, videotape, etc.

$Cap.Pr.M - *Capital cost ($) of print material.*
Cost of printed support materials whether bought commercially or produced within the institution.

$NPr.M/Pro - *Cost ($) of non-print material per programme.*

$Pr.M/Pro - *Cost ($) of printed material per programme.*

$Sw/S - *Cost ($) of software per student.*

$Sw.Pro - *Cost ($) of software required for programme.*
This is the cost of providing both print and non-print materials for the programme.

$Sw/Pro.Un - *Cost ($) of software per programme unit.*

APPENDIX 11-F

GLOSSARY OF ACRONYMS FOR SUMMARISATION MODULE

N.FX.Ava - *Number of facility Xs available*
Refers to the number of operational resource units that are simultaneously available for the programme.

Max.N.Pro.Un/FX.Dy - *Maximum number of programme units per FX daily.*
The maximum number of programme units that can normally be channelled through one complete enabling resource unit during a teaching day.

Max.N.S./Dy - *Maximum number of students per day.*
The maximum daily throughput of students per day for the designed programme.

N.S.Er.Pro - *Number of students enrolled in the programme.*

Pro.Un/S - *Programme units per student.*
The number of microteaching units that each student is expected to participate in. This may be an average figure or a set figure, but refers only to the number of programme units for one student.

N.Pro.Un/Pro - *Number of programme units per programme.*

Min.Pro.t - *Minimum programme time.*
The minimum time required to complete the planned programme. The unit of time used here will be in days or parts of days which may be expressed in terms of programme time units.

Act.Pro.t - *Actual programme time.*
The actual planned time that it is envisaged that the programme will be completed within.

Act.Min.Pro.t - *Actual minus minimum programme time.*
If the planned time of the programme is greater than that of the theoretical minimum, the difference in time units is seen as an excess. However, if the planned programme time is less than minimum time, the administrator had best review his decision in relation to throughput and resource usage.

Ex.Pro.Un - *Excess programme units.*
When the excess or deficit time units are multiplied by the number of complete resource units that would be simultaneously available for the excess time units a measure is gained for the amount of actual unused programme units.

AvaFX/Pro.Un	- *Availability of FX per programme unit.* Allowance must be made for the number of excess programme units for which no facility Xs would be available. If two FXs are simultaneously used per programme unit, then a total of two units of non-available time is derived.
Act.Ex.Pro.Un	- *Actual excess of programme units.*

PART B

ANNEXURES

ANNEXURE A-1

HIGHER EDUCATION RESEARCH UNIT

MONASH UNIVERSITY

MICROTEACHING PROJECT

WHAT IS MICROTEACHING?

The term microteaching has been thrown on to the teacher education scene following experiments which began at Stanford University in 1963. The microteaching structure is a scaled-down teaching encounter. A teacher presents a brief well planned lesson to a small group of students or peers. The scaling down reduces to manageable proportions the number and complexity of stimuli usually faced in the regular classroom. Each lesson can be recorded on video equipment, although the same techniques can be employed without videotape. The advantage of recording is the immediate feedback. The teacher can watch the lesson and view his own performance and there is a concrete basis for discussion with the supervisor, or for a reteach experience with a different class. Allen and Ryan[1], in a comprehensive account of microteaching, suggest that there are five essential propositions basic to the idea of microteaching:

> "First, microteaching is real teaching. Although the teaching situation is a constructed one in the sense that teacher and students work together in a practice situation, nevertheless, bona fide teaching does take place."

It was vital to establish a positive correlation between successful performance in the microteaching situation and teaching in the ordingary class situation. Various studies by Allen assert quite definitely that the microteaching performance does provide a reliable basis for predicting strengths and weaknesses in the general classroom.

> "Second, microteaching lessens the complexities of normal classroom teaching. Class size, scope of content, and times are all reduced."

Such practice should accord with favoured fundamentals of learning. A frequent number of limited practice sessions appears preferable to an occasional longer session. The microclass size, micro-content volume, and brief exposure should minimize anxiety.

> "Third, microteaching focuses on training for the accomplishment of specific tasks. These tasks may be the practice of instructional skill, the practice of techniques of teaching, the mastery of certain curricular materials, or the demonstration of teaching methods."

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[1] Allen, D. and Ryan, K. Microteaching. Addison-Wesley Publishing Co., Inc. London, 1969.

The aim of teacher education programmes should be to graduate teachers competent in their use of teaching skills, with a variety of teaching behaviours to draw on when confronted with different situations. The education of teachers should encompass a deliberately planned approach directed toward definite aims; it should not be a hit or miss piecemeal experience with vague undetermined aims.

On viewing teaching styles in many teaching situations in many classrooms, behaviours which involve competent teaching performance, regardless of subject matter, become apparent. It has been found that many new and experienced teachers lack the ability to reinforce student participation. Too many teachers overemphasize questions which require the simplest cognitive student involvement; teachers often accept any verbal response made by students and then clarify answers themselves without probing and getting the student to go beyond his first response. Some teachers seem to have a gift for maintaining attention throughout an instructional sequence while others do not. Silence makes teachers uncomfortable and so they break the silence themselves. Small group lessons are often run in the same way as larger classes.

Berliner[1] concludes that teaching does include discernable teaching skills, some of which are apart from any particular subject content area. He suggest they can be developed through training to become part of a teacher's professional behaviour.

> "Fourth, microteaching allows for the increased control of practice. In the practice setting of microteaching, the rituals of time, students, methods of feedback and supervision, and many other factors can be manipulated. As a result, a high degree of control can be built into the training program."

The current deficiencies in education make it increasingly difficult to organize experiences in classroom practice and observation. This problem arises out of a number of factors - in each State there are thousands of students in training: the available numbers of suitable qualified and experienced supervisory staff falls far short of the numbers required; the geographical situation of these teachers is often far removed from the training institutions, causing concern at the time spent in travel as compared with the time spent in practice or observation. More important than all of these are the nagging doubts regarding the costs and effectiveness of these procedures in the teacher education program.

> "Fifth, microteaching greatly expands the normal knowledge-of-results or feedback dimension in teaching. Immediately after teaching a brief micro-lesson, a critique of performance is possible."

The use of videotape provides most compelling and convenient evidence for most stages although it is not always essential. A videotaped classroom sequence does provide a valuable focus of attention for co-operative analysis by 'staff and student'. Immediate and accurate feedback of a teaching sequence is provided. Self-analysis can be practised whenever desired.

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[1] Berliner, D.C. 'Microteaching and the technical skills approach to teacher training', Technical Report No. 8, Stanford Center for Research and Development in Teaching. October, 1969.

Serious research has shown that microteaching is not a passing fad; neither should it be regarded as a panacea for aspect of sorely harassed teacher education programmes. Much work is necessary to devise the most effective applications of this technique.

Accepting the assumption that, as a pre-service and in-service training technique, microteaching is superior to more conventional methods of teacher education, the aims of the Higher Education Research Unit's project are to investigate -

(a) what constitutes the most effective microteaching situation (in-service and pre-service)

(b) what are the differences in both capital and recurrent costs between the microteaching system and current systems for achieving similar objectives with both small and large numbers of students.

ANNEXURE A-2

MONASH UNIVERSITY

HIGHER EDUCATION RESEARCH UNIT

MICROTEACHING PROGRAM

HIERARCHICAL DESCRIPTION OF THE JOB "TEACHING"

1. Job Description - teacher of economics

   Aim - to teach a course in economics to a specified level(s).

2. Duty (Duties) of the teacher of economics

   Duty can be defined at several levels to cover several duties which centre on the presentation of segments of work which make up the economics course.

   Duties:

   (a) To provide a syllabus for the course in economics. Usually based on a year.

   (b) The work defined in the syllabus is divided into terms. The teacher is expected to present and cover this defined segment of the course in a term.

   (c) Organization and teaching of the course on a major topic basis.

   (d) The organization and teaching of the course on a weekly basis.

   (e) The most fundamental aspect of a teacher's duty is the daily lesson. The teacher provides a statement of aims for the lesson and teaches to these prescribed aims.

3. Tasks:

   Taking the most fundamental duty, the daily lesson, tasks provide a logical framework on which to structure the presentation subject matter in order to achieve the goals of a lesson.

   By identifying teaching tasks, it is presupposed that a lesson has identifiable segments (tasks) which are in sum essential to the achievement of the duty to present and teach a particular lesson.

   Examples of teacher tasks:

   (a) Set induction (introducing)

(b) Revision of previously learnt materials

(c) Presentation of new material

(d) Reinforcement of new material

(e) Closure

In conjunction with these teacher tasks there are sub tasks which can be applied to any or all task levels. For example, subtask
(a) creating student involvement and participation
(b) structuring the lesson to ensure the use of the higher cognitive thought processes.

4. Skills/Techniques

In order to achieve completion of a task or sub task the teacher utilizes a range of skills which are deemed appropriate to the task in hand.

Examples of skills/techniques:

(a) Questioning skills

(b) Demonstrating

(c) Stimulus variation

(d) Lecturing

(e) Completeness of communication

(f) Repetition

5. For each skill/technique there are component parts. Some of these component parts may be unique to a particular skill, but on the other hand many component parts will be common to many skillls, the differences being centred on the use of these component parts in relation to the specified skill and task.

e.g. Components -

Questioning

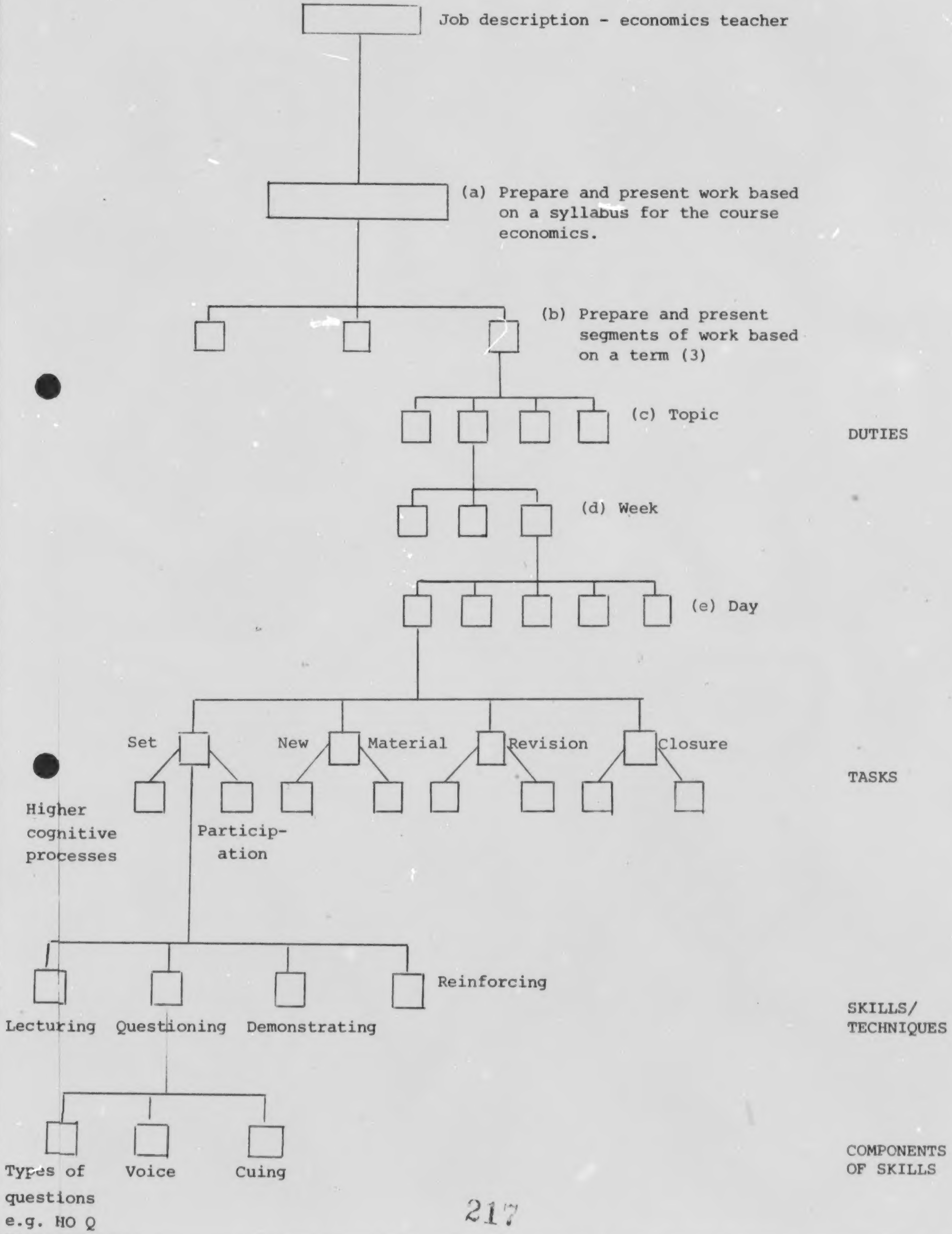
Higher Order Questions
Divergent Questions
Refocusing Questions
Redirect Questions
Probing Questions

Voice
Non Verbal Cues
Verbal Cues

Demonstrating

a. Presentation of a model
b. Use of media
c. Voice
d. Explanation
e. Cueing
f. Recognizing attending behaviour

ANALYSIS OF THE JOB "TEACHING".

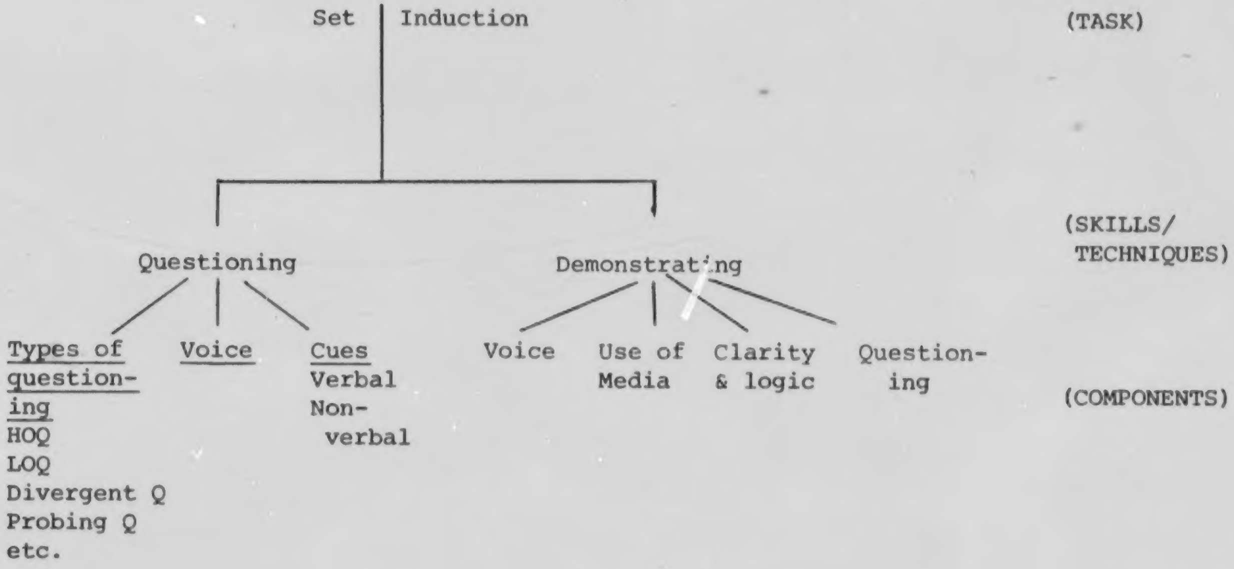

Job description - economics teacher
(a) Prepare and present work based on a syllabus for the course economics.
(b) Prepare and present segments of work based on a term (3)
(c) Topic
DUTIES
(d) Week
(e) Day
Set
New
Material
Revision
Closure
TASKS
Higher cognitive processes
Particip-ation
Reinforcing
Lecturing
Questioning
Demonstrating
SKILLS/ TECHNIQUES
Types of questions e.g. HO Q Divergent Q
Voice
Cuing
COMPONENTS OF SKILLS

The Higher Education Research Unit's microteaching program works within the defined hierarchy by providing a practice situation for tasks, skills/ techniques and components of skills and techniques, which has the element of feedback following each practice session. By implication a small segment of a duty is also practised (the presentation of particular subject matter), however the emphasis of microteaching in this program is aimed at the task level and below.

Specifically, the HERU microteaching program is asking student teachers to practice the task set induction by emphasizing one of two skills or techniques. That is, that the student teacher practices the task set induction by using either questioning techniques or demonstrating skills. Associated with each technique or skill there will be a range of component skills and techniques which the student teacher can call upon to achieve set. One aim of these practice sessions is that the student teacher will gain competence in recognizing when and how to apply the appropriate component of a skill to an appropriate classroom situation.

The two skills/techniques, questioning and demonstrating, are deemed to be on a continuum ranging from high verbal content to low verbal content, questioning being considered to use a high verbal content and demonstrating a relatively lower verbal content.

The "specific" level of the HERU
Microteaching Program.


Set Induction
(TASK)
Questioning
Demonstrating
(SKILLS/ TECHNIQUES)
Types of questioning
HOQ
LOQ
Divergent Q
Probing Q
etc.
Voice
Cues
Verbal
Non-verbal
Voice
Use of Media
Clarity & logic
Questioning
(COMPONENTS)

SET INDUCTION:

What are the objectives of set induction?

1. Achieve motivation/interest.

2. Encourage and promote participation.

3. To ensure students are informed and ready for the task ahead.

4. Achieve transfer from introduction to body of lesson.

To achieve these objectives students will be asked to use one of the two skills/techniques of questioning or demonstrating.

It is important to point out that the goal of each micro-lesson is to gain competence in achieving set induction via the specified skill or technique. Given this breakdown, it becomes necessary for supervisors to critique two functions, i.e. -

(a) Were the objectives of set achieved?

(b) How well the student teacher used the skill components?

This division becomes necessary because the situation may arise where a student can skillfully use a component(s) of a skill, but still fail to achieve the objectives of set induction. Note, however, that with the critique session, in relation to how well the student teacher used the component parts of the skill in question, the emphasis should be on did the student teacher use the appropriate component for the right situation and how well was that component of a skill used in that situation. Emphasis should not be on how many skill components did the student teacher use.

ANNEXURE A-3

HIGHER EDUCATION RESEARCH UNIT

MICROTEACHING PROGRAM

Aims of the Microteaching Program

The aims of the microteaching technique revolve around the notion that a scaled down classroom situation can be provided for a teacher to practice the achievement of identifiable lesson tasks via the use of specific teaching skills. The Higher Education Research Unit program is taking the task set induction (introducing a lesson) and asking trainee teachers to use one of the skills questioning or demonstrating to achieve set. These two skills have been classified further into component parts, but it should be emphasized that elements of questioning may be used during demonstration and vice versa. In other words, the elements of skills are not necessarily mutually exclusive.

Trainee teachers who have been designated to use questioning skills to achieve set are expected to develop their lessons based on a high degree of verbal interaction with the pupils.

On the other hand, those trainee teachers who have been designated to use demonstrating techniques are expected to present a lesson containing a lesser level of verbal interaction than those practicing questioning skills. Verbal communication will take place, and even some questions, but emphasis will be on demonstrating and non-verbal communication.

Expected Outcomes When Set has been Established.

1. The class is motivated and interested in the lesson to follow.
2. The pupils are prepared to participate in individual and class activities.
3. The pupils know what the lesson is to be about, and they are informed of the tasks that will be required of them.
4. The teacher will be able to transfer smoothly from introducing the lesson to the main body of the lesson.

NOTE: If your number ends with the digit one (e.g. 231E) the skill you are to use in microteaching sessions is questioning.

If your number ends in two (e.g. 212D) the skill you are to use is demonstrating.

ANNEXURE A-4

HIGHER EDUCATION RESEARCH UNIT

MICROTEACHING PROGRAM

Components of The Techniques, Questioning and Demonstrating.

References:	R.T. Hyman	Ways of Teaching. Chapter 9.
	B.S. Bloom	Taxonomy of Education Objectives.

Questioning

Questioning is a technique which can be used to achieve any of the tasks of teaching. Ranging from a simple empirical question, such as "What is this that I am holding up?", to questions which demand answers beyond that of simple recall and observation, (for example: "John, what are the implications of raising the level of interest on bonds in a purely competitive model given a fixed money supply?") questioning forms approximately one third of classroom discourse.

Questioning can be used to achieve many objectives such as

a) getting a student to participate
b) checking on a students comprehension
c) reviewing previous work
d) diagnosing students weaknesses
e) breaking the ice to get a discussion going

and a host of other purposes.

The technique of questioning can be structured just as the teaching task can be structured. Questioning is used for a specific purpose or intent that will fall into one or more of the following complementary categories:

a) Verification
b) Productive thinking
c) Cognitive functions
d) Information process activity
e) Response clues

A. VERIFICATION - is the determination of whether or not a statement is true. Verification is a guide to the meaning of statements and a guide to determining their truthfullness. In slightly different terms verification means that when describing a question we must do so in terms of evidence that would be appropriate to the particular question. The questioner then must have some idea of the terms he wishes in the response. In order to achieve verification of statement the following components are used:-

1. Analytic Questions that is, questions that elicit responses that are analytic statements. Analytic statements are "necessarily true" by virtue of the meaning of the words of which they are composed.

Examples

Q1.	What is a sitar?
Response	An Indian instrument something like a guitar, but longer and with more strings.

Q2 What does 'We shall overcome' mean?
Response It means that in the long run we will win.

To verify these responses we look to the set of rules that man has established. Questions seeking definitions of terms, translations, or meanings of phrases and statements are all analytic.

2. Empirical Questions are questions that elicit responses that are empirical statements. We verify an empirical statement by gathering evidence from the world of our sense experience. Empirical questions may elicit facts, explanations of empirical situations, comparisons, and if then of empirical conditions

e.g. If you place a block of ice in the sun what will happen?
It will melt.

3. Valuative Questions (Value or Evaluative)
are questions which elicit responses that are value statements by the respondent.

4. Metaphysical Questions elicit responses that are metaphysical statements. Such questions and responses are rare on the school teaching situation. To these questions there is little agreement as to the verification method to be employed in response to them.

e.g. How can we prove that God exists?

B. PRODUCTIVE THINKING - is defined as consisting in those divergent, convergent, and evaluative operations where by the individual draws upon available past and present acts, ideas, associations and observations in order to bring forth new facts, ideas and conclusions. The following components are used:-

1. Cognitive-Memory Questions are aimed at eliciting responses requiring cognitive-memory operations, which represent non-productive thinking operations. Cognitive memory operations represent the simple reproduction of facts formulae, or other items of remembered content through the use of such processes as recognition, rote memory and selective recall.

e.g. How do you spell rhinoceros?
Who was Australia's last Prime Minister?

2. Convergent Questions elicit responses requiring convergent thinking operations which involve the merging of diverse data. Convergent thinking represents the analysis and integration of given or remembered data. A convergent question asks for either a comparison, a contrast, drawing a conclusion, a summary, a generalization based on prior data, the translation of material from one form to another or an explanation.

3. Divergent Questions require divergent thinking operations. Divergent thinking operations allow individual freedom to generate independent ideas within a poor data situation. Divergent questions encourage elaboration of previous ideas the drawing of implications, the generation of new data and ideas as well as spontaneity, originality, flexability and initiative.

e.g. Say more about your idea on economic development.
What would have happened if Keynes had not produced the General Theory?

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4. Evaluative Questions elicit responses requiring evaluative thinking operations which deal with matters of judgment, value and choice and is characterized by its judgmental quality. These questions ask the respondent to express his personal opinion about some person, event or policy, to offer an assessment of what probably will occur and to offer a judgment based on a judgment previously offered.

C. COGNITIVE FUNCTION - function here refers to a specific purpose within verbal interaction, rather than to broad teacher goals such as "stimulating thinking". A question then may have function of for example, focusing the discourse or clarifying a response. To decide which function a question performs it is absolutely necessary to view the question in the context of the ongoing interaction. Note that a question may have more than one function simultaneously.

1. Focusing Questions are questions whose function is to provide the topic of a discourse. Focusing questions serve to introduce a topic and thereby indicate to the participants the intended direction of the discourse. These questions may also serve to refocus (refocusing questions) or sharpen a discussion that has strayed somewhat from its original course. They may also serve to change the subtopic of the discourse (refocusing).

2. Foundation Questions are questions whose function it is to elicit responses that will serve as the basis of a more complex question or discussion. They might request, for example, connecting evidence or criteria for an explanation schema, a valuative judgment schema, or a divergent thinking operation, but in such a way that evidence of criteria is presented. The sought after information may be gained via recapitulation or the presentation of new information.

e.g. Q. Review the main products grown in Latin America?
R. Coffee, sugar cane, bananas.

Q. Now, why do we trade with Latin America?

3. Extending Questions are questions that clarify or elaborate upon the statements already made. An elaboration can be used as a probe to help the respondent and listeners what else may be implied from other statements.

4. Lifting Questions have the function of eliciting from the respondent a level of thought higher or more complex than what has already been established for the ongoing discourse. Don't confuse extending question with a lifting question.

e.g. Q. Who is one of the most significant modern economists?
R. Kalecki
Q. Why?

5. Promoting Questions have the function of eliciting responses that help keep discussion going. Such questions may clear up impasses in the discussion, or may elicit responses which fill in missing parts in an explanation schema, or may prompt participants to draw explanatory conclusions or value judgments in order to keep the discourse from bogging down. Such questions, asked at the appropriate times, keep the participants from being overwhelmed by the complexity of the problems being studies.

D. INFORMATION PROCESS ACTIVITY - refers to the operation the questioner intends for the respondent to perform. Every question, by its very nature indicates to the respondent the information process activity expected. This is understood from the way that questions are phrased. Information process activity is complementary to verification, productive thinking, and cognitive functions.

1. Yes/No Questions indicate that the respondent is to respond with simple affirmation or denial.

2. Selected Question indicate that the respondent is to respond by selecting from stated alternatives. Alternatives given usually does not exceed two or three.

e.g. Do you think we will have inflation or deflation in the economy? (also an evaluative question)

3. Construction Question indicate that the respondent is to construct his own response based on information provided in the question. The question itself does not give a clue as to the correct response - the respondent must supply it himself.

e.g. Who was the immediate past president of the A.C.T.U?

4. Construction Yes/No Question indicate that the respondent should respond Yes or No, and at the same time construct his own response. This type of question involves the use higher order thinking processes.

5. Selection Yes/No Questions are ambiguous in that they indicate that the respondent may select from the stated alternatives or may respond Yes or No.

e.g. Q. If interest rates go up will the level of investment go up or go down?
R.A. Yes
R.B. Down

6. Selection - Construction Questions indicate that the respondent may select the one stated possibility or construct his own response.

e.g. Q. If interest rates go up, will the level of investment fall, or what will happen?

Again these questions involve the student in using higher order thinking processes.

E. RESPONSE CLUES - a method to characterize questions in terms of the class to the appropriate response within the question. These clues will primarily be found in construction type questions. More than one type of clue may exist in a question.

1. WH Clues gives the respondent clues based on such words as who, where, when, why, which, what, whose, and whom that are contained in the question. WH clues derive their meaning from the content of the discourse.

2. Parallel Term Clues questions that give clues in parallel terms gives the respondent clues by indicating that the appropriate response is like some other

information given previously in the discourse. The clues usually involve "some other", "another" or "something else".

e.g. Q. What is a course of unemployment?
A. Government policy.
Q. And another?
A. Lack of demand.

3. Excluded Term Clues questions with excluded terms give the respondent clues as to what not to use in his response. Excluded terms can also be used to set the level of the terms to be used in the response.

e.g. Q. What countries have the highest standard of living - excluding Nth. American countries?

4. Cited Terms Clues questions with cited terms give the respondent clues as to the terms in which he should phrase his response.

e.g. In terms of the Consumer Price Index what commodities have most rapidly increased in price over the last quarter?

5. Leading Question Clues Leading questions give the respondent strong clues as to what specifically is expected in response. Leading questions are often phrased as Yes-No questions.

e.g. Q. The DLP stand is against amalgamation of unions, isn't it?
R. Yes.

VOICE AND SPEECH

Good speech is an essential part of effective communication. In the classroom situation, the teacher who is unable to control and to vary voice and speech is strongly handicapped, since the spoken word plays a dominant part in such a situation. For the teacher, sound preparation of material is obviously necessary; yet only when this material is competently presented can a lesson be regarded as successful. In presenting a successful lesson, the teacher must make full use of appropriate vocal skills and speech techniques.

Factors that contribute to good speech include the following:

1. Distinction Vocal clarity is the result of good voice production. Associated with such production is forward tone, i.e. the ability to direct the voice to the front of the mouth. At all times shouting should be avoided, since it contributes to vocal strain. Verbal clarity occurs when articulation of consonants is firm. The clarity of English speech depends to a large extent on sound articulation of consonants.

2. Variety Many factors contribute to varied, interesting speech. The pitch range should be fairly wide, so that speech gains added colour and vitality. Tone should be varied, so that admonitions, explanations and directions are not spoken in the same way. Variation of pace is necessary. Teaching points need prominence and clean emphasis; consequently, they call for a fairly deliberate rate of delivery. However, qualifications and explanations can be spoken more rapidly, thus producing the variety that is an integral part of effective teaching.

3. Vocal Projection This is closely related to voice production. A relaxed approach and effective use of forward tone ensure that vocal projection is achieved without strain. Naturally, the size of a room determines the amount of volume used.

4. Control of pitch The central area of the voice is the most comfortable for all speakers, but, of course, some use should be made of upper notes and lower notes.

5. Fluent delivery Speech that is both relaxed and fluent is easy to listen to and to follow. It suggests confidence in the speaker.

In the final analysis, the teacher's ability to capture and to hold the attention of a class is largely determined by his use of voice and speech. Nothing that suggests artificiality or affectation is required. Nor should the student try to acquire a set of vowels of a falsely refined character. At all times, naturalness is essential. Nevertheless, in the modern classroom, the teacher has a positive responsibility to introduce interest and colour into his presentation. Intelligent use of voice and speech plays a large part in achieving such interest and colour.

NON VERBAL COMMUNICATION

Research on the verbal interaction between students and teachers has shown that in many instances discussions are teacher centred, with many teachers relying completely on their voice to control, guide and give directions.

The use of silence and non-verbal cues is aimed at increasing pupil participation, and simultaneously cutting down on the amount of unnecessary teacher interjection. This does not necessarily mean that the teacher loses elements of control and guidance, but merely that he gains non-verbal tools which can be used in place of verbal commands and directions.

Types of non-verbal cues

(a) Facial Cues In response to a student query or answer, a teacher may smile, frown, look quizzical, raise an eyebrow, and so on. These facial cues may be used as signs of acceptance or non acceptance, encouragement, or redirecting questions (e.g. nodding his head to John to reply to a question that Mary has raised).

(b) Eye contact To increase the level of rapport with pupils, interpersonal contact between pupil and teacher is improved by the exchange of mutual glances. When asking a question or trying to elicit a response from a pupil, the establishment of mutual eye contact is one method of increasing rapport and intimacy with the pupil. Note, however, that eye contact must be mutual to be meaningful, and that mutual eye contact can be overloaded and broken if done for excessive lengths of time and if proximity to the pupil is too close. The switching of eye contact from one pupil to another can also act as a controlling and redirective device.

(c) Body Movements and Gestures A teacher can convey meaning to his pupils by body movements and gestures. Meanings such as encouragement, warmth, praise, disapproval, and the redirection of discussion may be conveyed by walking towards a pupil (proximity) gesticulating with the arms, banging on the chalkboard, holding the head in the hands, etc.

All these movements and gestures convey meaning that does not rely on verbal communication, thus providing a means to reduce teacher talk and adding a variety of stiumul to classroom discourse.

DEMONSTRATING

Demonstating is the presentation and/or illustration of specimens, events or facts. The demonstration may make use of a variety of media such as a diagram on the chalkboard, a pictorial illustration, a physical model, a set of apparatus, tape recordings, etc., but must be used with a definite outcome in mind.

Demonstration can be used to:

1. illustrate an event, process or object
2. analyse events and structures
3. provoke discussion and questions
4. present new concepts
5. reinforce theoretical knowledge.

A demonstration may aim at only one of the above goals, or may simultaneously aim at achieving all of them.

In order to achieve any of the above outcomes, a demonstration should be:

(a) presented in such a way that it is observable to all the pupils in the class. For example, is a chalkboard diagram big enough for all to see and is the teacher blocking the view of some of the pupils?

(b) simple and uncluttered. For example, is the object of discussion in a pictorial illustration clearly observable, or is it a minute section of an illustration surrounded by irrelevant objects?

(c) logically linked with the planned lesson content. The demonstration must serve a purpose with particular learning outcomes in mind, and presented in such a way that the pupils are aware of the purpose for which the demonstration was used.

(d) pitched at an appropriate language, perceptual and cognitive level to the class in question.

(e) backed by an adequate level of knowledge on the part of the teacher.

LECTURER: Yes, very good. Well Marilyn, what about this word bitterly. How would you describe bitterly?

MARILYN: Something strange must have happened before this, surely. Something has built up to this point where they're saying 'don't you care for my love' and she's rather serious about it and he just seems to be making fun of her handing her a mirror and saying 'ask yourself all these questions' but then he says 'she would have broken it over my head'. So she was really serious and I think he was just playing along.

LECTURER: Very good. Well Ann, Marilyn has brought in this nore of non-seriousness, what are some other words or passages in the poem that suggest that it's not a very serious argument.

ANN: I think the fact that he's frightened that she'll hit him over the head with the mirror. There's something amusing about that it's almost as if there's two levels in the poem, one of honesty in the quarrel that Cathy mentioned, the fact that it looked as if it was a quarrel between people who knew each other well, but there's also a lighter tone of, well, of hitting someone over the head.

LECTURER: Well I think that's very good, I would agree with you there. Well do we all agree then that its not really a serious lovers argument it's rather a light-hearted what shall we say fight between a married couple.

CATHY: I wouldn't say it was completely light-hearted, I think there's an edge to it of perhaps Lawrence's belief that relationships between men and women have a certain flaw in them or can't be completely good.

LECTURER: You sound a little bit cynical there Cathy, would I be right in detecting this cynicism?

CATHY: Not necessarily my cunicism, perhaps my perception of Lawrence's pessimism.

LECTURER: That's a very good point, do you think the author is showing his cynicism in this poem?

CATHY: Yes.

LECTURER: And towards who Cathy?

CATHY: Women perhaps.

LECTURER: Women. What would you say to that Sue?

SUE: I suppose I would agree, slightly. It's a bit hard to say.

ANNEXURE B-1

INTRODUCTION

The Monash In-service Training Programme (MISTP) which you are about to undertake is a self-instructional learning package which is designed to assist you in improving your use and application of technical teaching skills in various classroom situations.

Unlike many other in-service training programmes, MISTP is designed to take place in the school during school time when it is most convenient for you.

MISTP further differs from other in-service training programmes in that you are not tied in any way to a supervisor. The entire programme is implemented by you, the teacher.

Implementation also includes evaluation; you evaluate your own performance and make amendments to your performance based on self-evaluation techniques. By using this type of format, learning becomes completely self-paced. You proceed at the speed which suits you.

Another break from traditional type of in-service training programmes is that MISTP is not completely concerned with theoretical subject development, but largely the practice of actual behaviours.

Emphasis is not on theory but on practice.

The MIST programme makes use of the microteaching technique. In using this technique you will be introduced to a specific teaching skill and then given practice in its use. The practice is carried out in a 'micro' situation, that is, you will use the skill in a reduced class time (5-10 minutes) to a reduced class size (4-8 students). At the end of each practice session you will have the opportunity to evaluate your own performance.

The above description of the Monash In-service Training Programme can be summarized as follows:

1. It is concerned with the development of technical teaching skills.
2. It is a self-paced instructional package.

3. It takes place in the school during school time.

4. It utilizes a concept of teacher behaviour which relies on skill identification and the building up of a teaching strategy.

5. It relies on the microteaching concept of practice and feedback in a micro-classroom environment.

CHAPTER 1

PROGRAMME DESCRIPTION

ELEMENTS OF THE MIST PROGRAMME

1. Microteaching is based on a teaching model which postulates that for an optimal learning situation it is necessary to:

   (a) state the desired student outcomes or behavioural objectives of the proposed learning episode;

   (b) establish the knowledge of the learner on entry to ensure that he or she has the necessary prerequisites to proceed into the new learning episode;

   (c) implement the teaching process or instructional procedures during which learning will take place;

   (d) evaluate the achievement of the learner in relation to the stated instructional objectives. If learner achievement has fallen short of an acceptable standard, then he goes back to one of the previous steps and starts again until a satisfactory performance level is achieved.

The microteaching model uses these same elements.

2. Having been informed as to the task and the objectives to be achieved, you will then be provided with information which will prepare you for the practice session. This preparation will consist of:

   (a) A description of the skill to be practised.

   (b) The completion of exercises which will give you practice in the identification of the elements of the skill.

   (c) The viewing, listening or reading of models on the skill or task to be practised.

   (d) The preparation of a 'key points' lesson plan for the microteach session based on (b) and (c) above.

3. You will then be expected to practise the skill in a 'micro' class situation, that is, the practice of the skill for a shortened period (5-10 minutes) to a reduced class size (5-8 pupils).

4. Finally, you will have the opportunity to study your performance by means of either a videotape replay or audio replay or your personal recall of the performance.

5. Evaluation of the performance is achieved by the use of carefully constructed rating forms, which attempt to give an objective evaluation of your achievement level.

DEVELOPING A TEACHING STRATEGY

6. Skills of Teaching. The MIST Programme is based on a view that the teaching act can be identified into behavioural skills and techniques. However, these skills and techniques only take on meaning when they are linked with the purpose of their use. The purpose of many teaching behaviours is to somehow ensure that attention, motivation are engaged so that pupil learning takes place. The promotion of learning is an overall task of the teacher which can be seen as occurring at several levels. For example, at the daily lesson level, the task of presenting a lesson is to ensure that predetermined facts, rules or concepts are learnt by the students of the class. In order to achieve this task the teacher calls upon various professional skills or behaviours to structure the learning situation. It is at this level, the application of teaching skills to promote student learning tasks, which the Monash In-service Training Programme is aimed.

7. By using a task analysis approach, a formal description is obtained of what the teacher does in the classroom. Teachers have several duties to fulfil during a school year, such as the teaching of specified subjects to particular grade levels, but it is at the level of the daily lesson that this in-service training programme is concerned.

7.1. Tasks. Taking the most fundamental duty, the daily lesson, task analysis provides a logical framework on which to structure the presentation subject matter in order to achieve the goals of a lesson.

Examples of teacher tasks:

(a) Set induction (introducing the lesson).
(b) Revision of previously learnt materials.
(c) Presentation of new material in a learning programme.
(d) Evaluation of student learning.
(e) Closure.

In conjunction with these teacher tasks there are sub-tasks which can be applied to and used within any or all task levels. For example, the sub-tasks of

(a) creating student involvement and participation;

(b) structuring the lesson to ensure the use of the higher cognitive thought processes;

(c) stating of objectives;

(d) the provision of reinforcement.

7.2. Skills/Techniques. In order to achieve completion of a task or sub-task, the teacher can call upon a range of skills and use those which are deemed appropriate to the task in hand.

Examples of skills/techniques:

(a) Questioning skills
(b) Demonstrating
(c) Stimulus variation
(d) Lecturing
(e) Completeness of communication
(f) Repetition

7.3. For each skill/technique there are component parts. Some of these component parts may be unique to a particular skill, but on the other hand many component parts will be common to many skills, the differences being centred on the use of these component parts in relation to the specified skill and task.

For example, Components -

Skill - Questioning

(a. Higher order questions
(b. Divergent questions
(c. Refocussing questions
(d. Redirect questions
Components (e. Probing questions
(f. Voice
(g. Non-verbal cues
(h. Verbal cues

Skill - Demonstrating

(a. Presentation of a model
(b. Use of media
(c. Voice
Components (d. Explanation
(e. Cueing
(f. Recognizing attending behaviour

The above task analysis is a means of describing the links between the use of basic teaching skills and the accomplishment of formally defined learning outcomes as determined by teacher tasks, duties and job descriptions.

8. From a Skill to a Strategy. Task analysis identifies and describes the relationship between skills, tasks and duties, but it does not tell you how to use particular skills. The teaching situation, however, is not just a relationship between tasks and skills, it is an interactive situation in which the teacher is required to interpret a situation and make a decision as to the most appropriate action for that specific situation. That is, the teaching situation is a dynamic one. For example, the communicating chain in a questioning situation is made up of the various combinations of

Question	→	Response	→	Reaction	→	New Question
(Teacher)		(Pupil)		(Teacher or Pupil)		(Teacher or Pupil)

The teacher can plan the initial question but has control over student responses only in a rather limited way. It is the clarity of a question that has predictive control over the pupil response, so the less clear a question is, the less chance there is of a teacher anticipating the correct response to come from the class. If a correct or desired response is not received by the teacher, the teacher's reaction is then to alter his planned approach by either rephrasing the question or by putting a question of lesser complexity. That is, any student response will require the teacher to select an appropriate action to cater for that particular situation.

STRUCTURE OF THE MIST PROGRAMME

9. As explained, the MIST programme is concerned with the practice and application of the questioning skill to the accomplishment of a particular teaching task. The programme develops this strategy in the following way:

9.1. MISTP takes as its first practice session the simple idea of being able to ask questions in a clear and fluent manner, and to be able to sustain a questioning situation for five minutes.

9.2. The second practice session which can be seen as the second progressive step in the development of a strategy builds upon the first practice session so that, not only are fluency and clarity to be practised, but they are to be practised with an emphasis on asking particular types of questions. In this second practice session you are expected to concentrate on asking lower order questions as well as continuing to develop the techniques of probing and redirecting to sustain questioning activity.

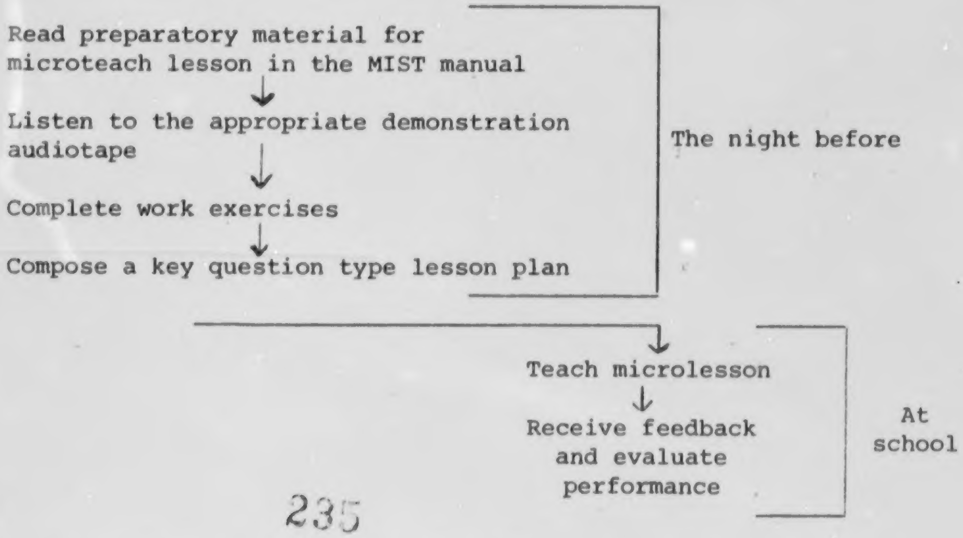
9.3. The third practice session builds on the previous two by asking the teacher to concentrate on the asking of higher order questions. At this stage the teacher is directed to use questions for a specific purpose. Questioning technique is to be used to teach a rule or concept. The teacher is now asking questions and guiding responses towards a predetermined learning outcome, making use of a complete range of pupil responses.

9.4. The fourth step assums that clarity and fluency are past the acquisition stage and that the teacher can sustain a questioning situation using a variety of techniques and types of questions. Given this, the fourth practice micro-lesson links the skill of questioning to a specific task, that is, the task of opening a lesson. Particular emphasis is placed on using questions to stage the objectives of the lesson and to probe the entry behaviour of pupils. The responses from pupils will be guided in such a way that the pupils supply the objectives to the lesson, and that their responses provide a feedback link to the teacher in relation to establishing the pupil level of entry behaviour.

9.5. The fifth and final step combines elements of all four previous lessons with the task of using questions as a motivation and arousal function. So the final micro-teaching lesson will be the use of the questioning technique to open a lesson in such a way that fluency and clarity of presentation are maintained, a variety of questions are used, the objectives of the lesson are derived from pupil responses to teacher questions. Entry behaviour of the pupil is probed and motivation and arousal of pupil interest is achieved.

PROCEDURE FOR MIST PROGRAMME

10.1. Suggested schedule for each practice phase



Read preparatory material for microteach lesson in the MIST manual

↓

Listen to the appropriate demonstration audiotape

↓

Complete work exercises

↓

Compose a key question type lesson plan

The night before

Teach microlesson

↓

Receive feedback and evaluate performance

At school

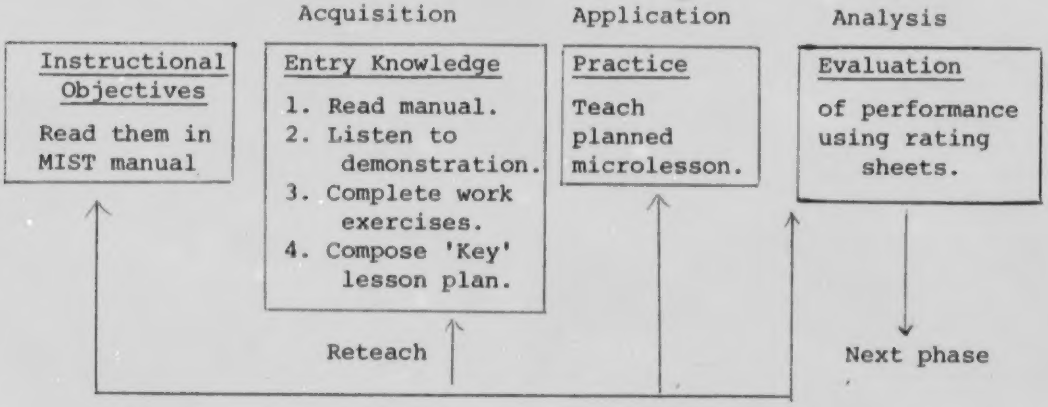
10.2. To facilitate acquisition of the skill and to prepare your own entry knowledge, you are required to read the objectives of each step, listen to a demonstration of the elements of the skill in use, and complete short drill exercises.

10.3. When familiarity of the concepts are achieved, you can then plan key points or questions which ensure the use of the specified skill components for that particular step of the programme.

10.4. Having completed these steps, you are then required to practise and apply the information. This takes place in a 'micro-classroom' with four to eight pupils who are known to you. You will teach these pupils for a reduced time period of between five to ten minutes, teaching a lesson which concentrates on the aspects of skill development stressed in the manual for that particular phase of the programme. As the microteaching situation is designed to give you practice in the use of a skill, it is better to choose pupils with whom you are familiar and have a good rapport, as this will create a less strained situation. Pupil responses to teacher questions will then be more easily elicited.

10.5. After the practice session you then evaluate your own performance. This is done with the aid of rating sheets which are a part of this manual. If it is felt that at any stage performance is inadequate, a second practice/ feedback session can be attempted for that particular phase.

10.6. In terms of the microteaching model, your workload for each of the five phases of the programme can be summarized in the following way.


Acquisition
Application
Analysis
Instructional Objectives
Read them in MIST manual
Entry Knowledge
1. Read manual.
2. Listen to demonstration.
3. Complete work exercises.
4. Compose 'Key' lesson plan.
Practice
Teach planned microlesson.
Evaluation
of performance using rating sheets.
Reteach
Next phase

To complete the MIST programme the above cycle will be repeated five times, where each successive cycle will correspond to a step in the strategy programme outlined in paragraph 9.

NECESSARY PREPARATION BEFORE PROCEEDING WITH MISTP

11.1. Procure a group of pupils to make up your microclass. Make sure that the pupils are co-operative as this will enhance the type of interaction that will take place. It may be of benefit to explain to the pupils why they are being asked to participate, but do not relate the exact aims of the programme as it is possible that pupils may want to help you by adopting a role which is not typical. This would then defeat the purpose of the teacher practising a particular strategy. A general explanation, such as "this exercise is part of a programme of five where teachers practise new approaches to teaching", would probably suffice.

11.2. If possible, choose a quiet room where there is not likely to be any disturbance while you are microteaching.

11.3. Make sure that pupils and room are available at the time when you want to do the practice phase of each step.

11.4. Procure a cassette recorder so that you may listen to the model audiotape which demonstrates the use of the component skills in each phase of the programme. If you are using audiotape feedback, you will also need an audiotape recorder for your practice sessions.

11.5. Plan in advance the days on which you are going to do your microteaching. Allow five to ten minutes for the actual microteaching, 15 minutes for your feedback and five minutes' organization time for moving pupils and talking to them prior to the actual microteach.

ANNEXURE B-2

CHAPTER 2

BASIC QUESTIONING TECHNIQUE
PERFORMANCE OBJECTIVES

During the first phase of the MIST programme you will practise the use of the following elements of the skill of questioning:

(A) Clarity and presentation of questions

- (a) Identify the respondent by the use of verbal and non-verbal cues.
- (b) Indicate response performance by use of action words.
- (c) Maintain optimum communication by the use of questions which -
  - (i) follow normal English grammatical structure;
  - (ii) refer to only concept at a time;
  - (iii) end with a downward intonation of the voice.

(B) Accepting and reacting to pupil responses

- (a) Listen to student responses without interrupting.
- (b) Use pauses and silence when waiting for and receiving pupil responses.
- (c) Use student responses as the basis for some further question or discussion.
- (d) React warmly to responses and give encouragement to student responses.

(C) Sustain a questioning situation

- (a) Use of probing questions and redirected questions to sustain an extended questioning situation.
- (b) Use of student responses as the basis for further question or discussion.

ANNEXURE B-3

CHAPTER 3

LOW ORDER QUESTIONS

Phase One of this programme provided you with practice in the basic mechanics of a questioning situation. Phase Two of the programme, and subsequent phases, are concerned with the application of the basic mechanics of the questioning technique to obtain specific student outcomes.

PERFORMANCE OBJECTIVES

1. During the microteach for Phase Two lesson, you will practise questions which will involve the students in emitting the following type of responses:

    (a) The recall of knowledge, ranging from the recall of specific symbols, facts and terms, to the recall of more complex bits of knowledge which involve the recall of methods, principles and theories.

    (b) The demonstration of understanding. This will involve the student in translating, interpreting and extrapolating or extending from bits of information presented to him.

    (c) The application of bits of information which have been recalled and understood, to abstract and concrete situations.

2. The mechanics of the questioning skill as described in Phase One are also to be practised in this microlesson.

ANNEXURE B-4

CHAPTER 4

HIGH ORDER QUESTIONS

Phase One of the MIST programme was concerned with the mechanics of a questioning situation, and identified elements of the questioning technique which encourages student talk, uplifts the quality of responses, and helps to sustain an interactive situation without the teacher dominating the questioning environment, but at the same time maintaining control.

Phase Two was concerned with the asking of particular types of questions which would engage the students in a particular cognitive process when responding to your questions.

Phase Three of the programme is an extension of Phase Two, in that the aim is the asking of particular types of questions with the intention of engaging particular cognitive levels in the students' response. However, the cognitive processes to be engaged are of a higher order. In this chapter you are to study and practise the asking of questions which involves the student in the learning tasks of analysis, synthesis and evaluation.

PERFORMANCE OBJECTIVES

During Phase Three you will give emphasis to practising questions which involve the students in

(1) Analytic processes, ranging from the analysis of elements and relationships to the analysis of organizational principles.

(2) Processes involving synthesis. This will involve the student in producing unique communications, producing or planning an operation or deriving a set of abstract relationships.

(3) Evaluative processes which will involve the student in making judgments of materials and methods in relation to internal or external criteria.

ANNEXURE B-5

CHAPTER 5

SET INDUCTION

FROM A SKILL TO A STRATEGY

The first three phases of the MIST programme were concerned with the development and acquisition of various elements of the skill of questioning. Phase One of the programme was concerned with particular "mechanical" elements of questioning in an instructional situation, while Phases Two and Three were concerned with practising the use of questions in order to engage students in specified cognitive processes when they responded to a question.

Each of the first three phases of this programme was artificial and limited in that you were asked to emphasise only the elements of the skill of questioning which were contained in that particular phase of the programme. This narrow focus of the practice period was necessary so that acquisition of the elements of the questioning technique described in those first three phases could be optimized.

The final two phases of this programme assume that you are now able to identify and consciously use the 'mechanical' aspects of questioning in dynamic situations and can consciously elicit and sustain student responses of a designated cognitive level.

Phases Four and Five move away from the tightly structured micro-lessons encountered in Phases One, Two and Three, and intend to engage you in decision-making procedures of the sort where you, the teacher, will have to choose what you consider to be the best elements of the skill of questioning in order to achieve aspects of the overall task of set induction. This marks the movement from practising the elements of a skill to the practising of a teaching strategy because it is now assumed that, not only have you acquired and can use the elements of the questioning skill described within the first three phases of the MIST programme, but have also reached a point where you can now practise certain decision-making capabilities.

This programme is asking you to develop a strategy to achieve the task of set induction, with emphasis being placed on using elements of the technique of questioning as outlined in Phases One, Two and Three of this programme.

A STRATEGY IS IDENTIFIED BY A SITUATION WHERE THE TEACHER IS CONSCIOUSLY CHOOSING AND USING VARIOUS ELEMENTS OF A TEACHING SKILL IN ORDER TO ACHIEVE THE COMPLETION OF A TEACHING TASK.

PERFORMANCE OBJECTIVES

The objectives for Phases Four and Five of the MIST programme are not as specific as the first three phases of this programme because of the more dynamic nature of the tasks that you are being asked to perform.

For Phase Four you are asked to use elements of the questioning technique to achieve the overall task of set induction with an emphasis on achieving:

(i) the sub-tasks of stating and clarifying the objective for the lesson;

(ii) and the sub-task of probing student entry behaviour levels.

ANNEXURE B-6

CHAPTER 6

SET INDUCTION (CONTINUED)

OBJECTIVES OF PHASE FIVE

In this final phase of the MIST programme, you will practise the complete set induction task, which is composed of the sub-tasks:

(a) stating and clarifying objectives;

(b) probing and determining student entry behaviour;

(c) motivating and arousing students towards the task in hand.

In this chapter, descriptions of the motivation and arousal functions will be given. However, during the practice phase you are asked to practise the overall task of set induction, using strategies which emphasize the questioning technique and which also achieve the sub-tasks of set induction as described above.

ANNEXURE C-1

TRANSCRIPT OF MIST AUDIO TAPES

DEMONSTRATION UNIT NUMBER ONE - IDENTIFICATION, PROBING AND REDIRECTION

This is demonstration unit number one which is to be used in conjunction with Phase I of the Monash In-service training programme. When listening to the tape you are asked to listen to a model of a micro-class situation which demonstrates the use of respondent identification, respondent performance indicators and the use of probing and redirecting questions. When listening to the following demonstration unit, try to identify each component of the questioning situation that is used. You will notice that in some places respondents are not verbally identified; when this occurs a non-verbal identification cue is being used. Before proceeding to the micro-class demonstration listen to the following examples of the use of downward intonation of the voice when asking such questions as these: 'What is the answer to this problem?', 'What is the capital of France?'. Do not use this intonation pattern. 'What is the answer to this problem?'. Now listen to the microteaching demonstration segment.

LECTURER: We've all read this poem which we have in front of us. Ann, would you like to suggest the sort of situation you think this may have occurred in.

ANN: It seems as if it is a lover's quarrel; you get the man's response to the woman asking, 'Don't you care for my love?'

LECTURER: Yes, would anyone like to add something to that? Cathy?

CATHY: Well, it seems to me more like a husband and wife situation; at least where both partners know each other very well and know each other's responses.

LECTURER: That's very interesting. Why do you say husband and wife quarrel?

CATHY: Well, just because at least the man seems to know the other person so well, he seems to feel at liberty to tell her exactly what he thinks.

LECTURER: Sue, would you go along with Cathy's statement on that?

SUE: Yes, I do.

LECTURER: And why is that? Why would you think that it's a husband and wife quarrel?

SUE: Well, maybe not husband and wife, but obviously a pair who don't seem to be taking the argument too seriously. Although the poet writes, '"Don't you care for my love?" she said bitterly', that seems to be the only thing that would determine my thinking that it wasn't a serious quarrel - just a sort of, I don't know, playing with each other, I suppose.

LECTURER: You don't sound too sure.

SUE: No.

LECTURER: O.K. Well, Ann, you seem to be a bit strong on Lawrence; what do you think about his attitude toward women as displayed in this poem?

ANN: I don't know that it's necessarily towards women, it's perhaps just love between men and women. More the notion, I think, of handing her the mirror and saying you can't love someone else till you love yourself, or look at your own love before you ask me the question, 'Do you care for my love?' The question is what is the nature of your love.

LECTURER: So let's get down and look at this question of love. Does he express a certain point of view about love in this poem? Or is he casting some sort of reflection on what love may be?

ANN: A reflection of oneself, perhaps. Her own reflection.

LECTURER: Very good. And, Ann, her reflection, do you think there's some personal relationship to Lawrence expressed in this poem?

ANN: It could be, yes; it probably is autobiographical or something like that.

ANNEXURE C-2

DEMONSTRATION UNIT NUMBER TWO - LOW ORDER QUESTIONS

This is demonstration unit number two which is to be used with Phase II of the Monash In-service training programme. When listening to this tape, take particular notice of the style of response that is elicited when lower order questions are asked. Note that, although the emphasis is on asking lower order questions, not all questions are in this category. While listening to this demonstration segment try to classify the lower order questions into the categories of recall of knowledge, understanding of knowledge or application of knowledge.

LECTURER: Now we've been talking about growth; we've been looking at some of the conditions of growth. Now, fairly quickly, can you give me some of these conditions that we've been looking at, particularly I'm thinking of in regard to plants. What are some of the conditions necessary for the growth of plants?

RESPONSE: Sun, light.

LECTURER: Right.

RESPONSE: Proper nourishment.

LECTURER: Right.

RESPONSE: Water.

LECTURER: Good. Anything else?

RESPONSE: Right soil.

LECTURER: Good. Does that come under nourishment? We can put it down.

RESPONSE:

LECTURER: Good. What then - there's some aspect of climatic conditions that we haven't listed I thought might have come out by now. Something like light.

RESPONSE: Temperature.

LECTURER: Very well. Now all of these things can be grouped together under one name. I wonder can you tell me what that is. What term could we use to apply to all of those things? They're all aspects of what?

RESPONSE: Environment.

LECTURER: Very good. Now there are two things upon which the growth of an organism depends: one of those is environment; I wonder what the other one is.

RESPONSE: The genes and the hereditary.

LECTURER: The genes and the hereditary - what's another term we use? Another term in place of genes or hereditary. All right, hereditary will do. So we've got two factors, then, or two things that determine the way in which an organism will grow. Now which of these two factors do you think has influenced the growth of this plant? This particular plant came from a dry area in the front of my garden, elevated, sandy soil, not very rich; this one came from the back of the garden where there was in fact a good deal of manure thrown. So what is the factor, then, that caused the difference in growth there?

RESPONSE: Light.

LECTURER: Could be light but, in terms of the two factors that we've looked at, which of the two is it?

RESPONSE: Soil.

LECTURER: Which of the TWO?

RESPONSE: Environment.

LECTURER: Environment; we're looking at environment, hereditary. All right. So there's not much question as to which of these two has influenced the growth there in the light of what I've told you. Stunted sort of growth, very lush sort of growth. There's exactly the same species of plant, not different species; so, if I put this plant into the same sort of environment, what might we expect to happen? If I grew this plant in the same sort of environment as this one, what might we reasonably expect to happen?

RESPONSE: Same growth pattern.

LECTURER: It would have a little while to catch up; the other one's got a great advance on it. Yes, we'd expect it, if it's an environmental factor. Well, now look at these two. These are two identical species; they're both a variety of orchid, a particular variety. What would you say about them? Is it hereditary, the difference, or do you think it's an environmental cause?

RESPONSE: Hereditary.

LECTURER: How many people would say it's hereditary? How many people would think it's perhaps an environmental cause? Can you, David, can you back your statement? Why do you think that it's probably environment?

DAVID: One of them has grown quicker than the other one has. If they're both the same species, they should both grow at the same rate if it is hereditary, but it's environmental so they grow quicker.

LECTURER: What aspect of environment do you think has produced this growth, David?

DAVID: The environment.

LECTURER: But what aspect of the environment?

DAVID: More food.

LECTURER: More food. Can someone suggest something else?

RESPONSE: Light.

LECTURER: Doesn't light tend to make things grow up, make things grow long? Could be. Now is there anything about that that sort of supports that view? Do you see the growth of that? See how it's short. Now is there anything on this plant that seems to support the view that it's an environmental condition that's caused it to grow like that? What is there that seems to support that view? Come on - something you can see. Yes?

RESPONSE: The leaves aren't looking healthy.

LECTURER: I see. Something else? What about that bit of growth there where I'm touching? What's that piece there? See, that's new growth. What does that look like? Short like this one. Now this particular plant I suppose has been growing in a glasshouse for four or five months; this one about three months. Before that I wouldn't have any idea of the environment under which they were growing. So I'd be as interested as you are to see whether this is in fact a genetic condition due to its genes, or due to its hereditary, or whether it's in fact an environmental factor. Well, now let's quickly look at one or two others. What about the orchid here? Two colours in the flower - what would you say was the factor there - hereditary or environment?

RESPONSE: Hereditary.

LECTURER: Why?

RESPONSE: They're basically the same type of plant, except some orchids grow yellow and some grow like these, it just depends on.....

LECTURER: Why don't you think that it's environment?

RESPONSE: The plants are the same size......

LECTURER: The same size. Something else? Phillip?

PHILLIP: They grew in the same pot.

LECTURER: They grew in the same pot; how could they escape having the same environmental conditions? So they've had the same environment, so the difference in colour can't be purely environmental.

ANNEXURE C-3

DEMONSTRATION UNIT NUMBER THREE - HIGHER ORDER QUESTIONS

This is demonstration unit number three, which is to be used in conjunction with Phase three of the Monash In-service training programme. When listening to this tape note the length and type of responses that are elicited from the students when higher order questions are asked. Not all the questions asked are of the higher order type; however, the emphasis is on asking these types of questions.

PART A

LECTURER: Four men have been playing poker. At the end of the game their hands looked like this: Player A, Player B, Player C, and lastly Player D. Question: who wins the game?

RESPONSE: Player B.

STUDENT: No, Player D.

LECTURER: Now why Player B, Cath?

CATH: Because he's got four aces.

STUDENT: What about Player D? He has a run of five cards in one suit.

LECTURER: There seems to be a little bit of disagreement amongst you about this. How do we decide who wins the game?

RESPONSE: Look up the rules of poker.

LECTUER: O.K. We look up the rules of poker and they tell us that Player D wins. Now there must be some logical reason why a rule like this would be made. Now what do you think it would be?

RESPONSE: Well, it's more difficult to get a run of five on one suit than to get four aces.

LECTURER: How do you mean, more difficult?

RESPONSE: She meant it's less likely to occur.

LECTURER: Do you think you could put that in a slightly different way?

RESPONSE: Well, the probability of getting a run of five cards in one suit is less than the probability of getting four aces.

LECTURER: Very good. Now, you should be able to tell me, then, how we can decide who wins the game.

RESPONSE: We calculate the probability of getting a particular hand and the hand with the least probability of occurring wins.

LECTURER: Very good, Cath. Let's have a look at Player B's hand once again.

PART B

LECTURER: Perhaps we should consider Neil's notion of freedom. Does anyone feel able to summarize what they believe Neil's notion of freedom is? If Neil were asked to state his idea of freedom in a definition or single sentence, how would he characterize it?

RESPONSE: He could start by saying that it's free to do anything you like that doesn't interfere with other people. I know that's not his whole definition, but it's a part of it, isn't it? If you want to eat only one type of food, or not wear shoes, well, that doesn't hurt anyone else, so you should be allowed to do it. But there's more to it than that.

LECTURER: Yes, now actually you've imported into that Neil's prescription as well, haven't you? Because in a sense his idea of freedom is the area of activities which are freely open to one. Now can anyone think of another way of looking at the question of freedom which isn't really accounted for in Neil's definition? Perhaps an example - suppose a 68-year-old woman living on an old age pension and with very little money in the bank ponders her position and asks herself whether she is free to go on a world cruise. Now in Neil's sense is she free to go on a world cruise? In what respect isn't she, then?

RESPONSE: She's got a negative sort of freedom.

LECTURER: How come, Jeff?

JEFF: Well, she can make up her mind to go and say, 'Yes I can go', but she has no means of going, so the choice is a false one in a way.

LECTURER: Good. You see there is no restraint on her going, no legal restraint presumably, but you've suggested, Jeff, that it isn't a viable choice because she hasn't the means to go; she hasn't the money. Can anyone formulate a notion of freedom which would take account of that sort of situation?

RESPONSE: I'm not sure if this is what you're thinking of, Dermid, but it seems to me that you can get back to the notion of education. Unless you give people the opportunity to in fact develop along certain lines or to open up certain areas, then in fact their choices are limited in lots of different ways. This is perhaps a bit like the situation of the woman without money, but...

LECTURER: That's good. Yes, that's very good. Ann, you were wanting to say something.

ANN: Would that mean that in fact Neil's kids weren't free because, for instance, some types of education they aren't free to be historians because at the end of school they mightn't know what history is sort of thing.

OTHER: Well, it's not quite like that; it depends actually whether you accept, I think, that there are certain periods in one's life in which one learns to, say, play the piano best or to learn languages best. I think there is other evidence to suggest that you can, for example, teach adults reading in a matter of a month if they are sufficiently motivated and perhaps the same thing goes for things like physical co-ordination and other things as well. But perhaps he's in fact doing them a disservice by simply not providing any external motivation at all or very little.

LECTURER: You're on to a very good point, Ann, and I think to clinch it we need to clarify the notion of freedom. There's one sense which is freedom in the John Stuart Mill sense, which I believe Neil is fairly close to, and that is that one discovers the area in which one is free to act by, if you like, subtracting all those areas under which one is under some obvious restraint, perhaps a legal or physical restraint. There's another way of looking at freedom, and this is being brought forward by, among other people, Isaiah Berlin in "Two Concepts of Liberty", which sees freedom as the area.......

PART C

BIBLIOGRAPHY
OF
MICROTEACHING

First edition, 1971
Second edition, Oct. 1974

BIBLIOGRAPHY
OF
MICROTEACHING

WITH SELECTED ANNOTATIONS

J.C. CLIFT
J.I. MALLEY

October 1974
(interim edition 1971)

This bibliography was prepared as part of a project investigating the cost effectiveness of the microteaching technique. The project was conducted at Monash University and supported in part by a grant from the Australian Committee for Research and Development in Education. The final compilation has been completed by the University Teaching and Research Centre, Victoria University of Wellington, New Zealand.

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PREFACE

Microteaching which provides a scaled down, non threat teaching situation with feedback for teachers to practice elements of a teaching task, is at the stage of development where it can no longer be considered a new technique. The concept of microteaching originated from Stanford University in 1963, although it is only since 1969 that the significant body of research on microteaching has taken place. The number of research studies and higher degree dissertations which have arrived on the scene since 1969 are in stark contrast to the rather amorphorous journal description of what constituted microteaching, in the pre 1969 era.

The availability of these research writings occurs at an appropriate time, since a recent survey on the use of microteaching in Australia, Turney et al (1973), indicates that even though microteaching techniques are used on a relatively extensive scale, implementation programs within teacher training institutions generally are adopted with scant attention being paid to theory and research evidence. It is hoped that this bibliography, by bringing together the titles contained within the following pages, will help remedy this situation.

This bibliography is part of a larger study on the cost effectiveness of microteaching, which was conducted by the Higher Educational Research Unit of Monash University on a grant from the Australian Advisory Committee for Research and Development in Education.

An interim bibliography for which the initial compilation had been carried out by Mrs. Vivian Nash of the Monash University Library was published in 1971. This bibliography was then added to by an extensive literature search conducted by the research staff of the Higher Educational Research Unit. The final compilation was carried out by the University Teaching and Research Centre at Victoria University of Wellington. The updated and revised edition also contains a number of annotations of the more important entries, where an annotation is provided the entry in the bibliographical list is marked with an asterisk (*).

This bibliography supplements the McAleese and Unwin (1973) bibliography and the list of references contained in Turney et al (1973) Microteaching Research, Theory and Practice.

When an entry is followed by a six figure number prefixed by the letters ED this refers to the E.R.I.C. document number available in microfilm.

J.C. CLIFT

J.I. MALLEY

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ADDITIONS.

462. CLIFT, J.C., BATTEN, H.D., BURKE, G. and MALLEY, J.I. (1974). *A Cost Effectiveness Study in the Use of Microteaching in the Education of Teachers.* Report presented to the Australian Committee for Research and Development in Education.

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1. ALLEN, D.W. (1966a). *A New Design for Teacher Education:* the Teacher Intern Program at Stanford University.
A description of the microteaching program at Stanford University, mentioning its aims, function and design, and outlining its distinctive features.

2. ALLEN, D.W. (1966b). *Microteaching - A new framework for inservice education.*
This general article outlines the uses and the advantages of microteaching particularly in relation to in-service training.

3. ALLEN, D.W. and CLARK, R.J. (1967). *Microteaching : its rationale.*
This provides the rationale behind the introduction of microteaching at Stanford University in 1963. A teacher training program was needed which was real, low-risk, adhering to learning theory, providing wide ranging experience and economic. The authors claim that once introduced microteaching allowed experimental and practice control, cut out the usual diversions and administrative detail, allowed immediate feedback and practice opportunity and saved time.

4. ALLEN, D. and EVA, A. (1968). *Microteaching. Theory and Practice.*
A general article defining and describing microteaching, discussing its advantages and listing the applications made at other institutions and organisations in America. Areas for further research related to its successful use are suggested.

5. ALLEN, D.W. and RYAN, K. (1969). *Microteaching.*
Microteaching is defined by five essential propositions and what it can do. The book includes chapters on the component skills approach, the elements of microteaching giving a practical guide for translating the idea into a functioning clinic including aspects such as patterns of training, supervisors, students their recruitment selection and training and videotape recording.

For microteaching in the pre-service setting the authors list the benefits for beginning teachers, supervisors and normal teacher education programs and they present the concept as a bridge between instruction and classroom practice. The in-service setting is put forward as microteaching's greatest potential particularly in regard to new techniques, team teaching and married women returning to the service. Other settings for microteaching are illustrated by 7 particular microteaching clinics ranging from an inner-only school to microcounselling.

A final chapter on research and microteaching puts forward numerous research possibilities such as self-modifying research into questions about the nature and sequence of elements the learning process in general including the use of models and self-confrontation situations, and the relationship between treatment and student background and aptitudes. According to the authors the effectiveness of microteaching can only be gauged in terms of specific teaching skills.

6. ANDERSON, D.W. and ANTES, J.M. (1972). *Microteaching for Preparing Teachers of Culturally Diverse Children.*
A study to examine the reactions of graduate interns to Micro Teaching and to determine the relationship between effectiveness in presenting a "micro" lesson and effectiveness in teaching in a regular classroom. During the six-week laboratory school each of the thirty-one interns (from the Graduate Intern Program for the Culturally Diverse - Uni. of Wisconsin) took part in at least four microteaching sessions of five-to-ten-minutes with two interns and five pupils.

Three evaluative instruments were used. A satisfaction index, created from comments in an essay written by each intern, showed 117 positive statements and 35 negative statements regarding microteaching. Evaluative scores were also collected for microteaching performance and for classroom performance, however there was not found to be a significant relationship between the two.

7. ANON (1970). Microteaching enters second generation of research. (Stanford Centre for Research and Development in Teaching).
After considering the expansion of microteaching in its first decade, the author describes the new approaches being taken as it enters its 2nd decade. Teaching skills are to be judged in terms of quality as well as quantity of times ex[illegible]ed. The cyclical aspects of teaching are being

investigated where cue attendance can lead to new teaching ideas. Attention to learners thoughts and needs rather than merely the interation processes is seen as a way of teaching a learner to learn. Stress reactions of teachers and ways of overcoming them are being explored. Some system whereby teaching skills are integrated is a possible future development. The student treatment interaction is also a new consideration.

8., AUBERTINE, H.E. (1967). Use of microteaching in training supervising teachers.
A report on the traning of supervisors by their participation in the Whitman Microteaching Clinic. The aim to improve the continuity of the training process as a whole was realized. The article describes the benefits from the microteaching for the training program, the supervisors and the school district.

9. BAKER, E.L. (1969). Relationship between learner achievement and instructional principles stressed during teacher preparation.
The use of five theoretically based learning principles by Peace Corps Trainees in fifteen minute lessons was correlated to some extent with performance gains made by pupils. The Author described the correlations as encouraging.

10. BANDURA, A. (1965). Influence of models' reinforcement contingencies on the acquisition of imitative responses.
This experiment draws a distinction between acquisition and performance of imitative behaviour by demonstrating that vicarious negative reinforcement inhibits performance but not acquisition of imitative responses.

11. BIRCH, D.R. (1969). Guided Self Analysis and Teacher Education.
A report on an experiment designed to evaluate the G.S.A. program of teacher training and to determine which of its three elements of self-confrontation, behavioural coding and self coding produce the most behavioural changes. A detailed description of the aims and rational of the program is given. Forty-eight student teachers formed six treatment groups and a no treatment control group was enrolled in a Social Issues course. Treatment included combinations of the three program factors ranging from minimum to maximum Guided Self Analysis schedules. There were six dependent variables consisting of questioning strategies, response strategies, total teacher talk, teacher/pupil talk patterns and a general index of interaction. Statistical procedures include a factorial univariated analysis of variance with the general index as the dependent variable, a factorial multivariate analysis of variance and least squares estimates of effects for the direction and relative size of effect of significant factors. The full G.S.A. group significantly outperformed all others on all interaction indices except teacher-pupil talk. The only factor to have significant effect on teacher behaviour was self-coding. Interpretations about a trend for inquiry orientation to change teacher behaviour are modified by the fact that the control group was not randomly assigned. Self confrontation alone, or the learning and practice of a behavioural coding system was not effective. Self coding was needed to actuate the effects of the other two factors.

12. BLOOM, J.M. (1969). Videotape and the vitalization of teaching.
A description of the intern microteaching program at the Wisconsin-Milwaukee University, its equipment and procedures and the skills that can be learned and the benefits, such as innovation and spontaneity, that can be gained.

13. BORG, W.R. (1970). Minicourse instructional model.
An overview of the Minicourse Instructional Model series for teachers, a total of seventeen courses in specific teaching skills within a microteaching context, being developed at the Far West Laboratory for Educational Research and shown significant changes in teacher behaviour. The seventeen sequences are described in terms of goals, and the procedures for their research and testing are shown to be tied to (actual) classroom data.

14. BORC, W.R. et al. (1969). Videotape feedback and microteaching in a teacher training model.
An experiment to evaluate the minicourse in an in-service setting and its two factors of practice and structured self feedback. The omission of practice and feedback factor had little effect on changes in teacher behaviour. Possible different procedures for pre-service use of course are suggested.

15. BORG, W. et al. (1971). The Minicourse : A microteaching Approach to Teacher Education.
The minicourses are an adaption of the Stanford microteaching formula whereby an auto-instructional package, produced by a research and development cycle is used to teach classroom skills. Their development by the Far West Laboratory for Educational Research and Development was prompted by draw-backs of the present teacher education programs and is part of an overall goal of developing a subsystem of teacher education in the area of classroom skills. This book provides a detailed account of the procedures, products and progress of the minicourses.

16. BORG, W.R. (1972). The Minicourse as a Vehicle for Changing Teacher Behaviour : A Three-Year Follow-up.
Report of a three-year follow-up of twenty-four teachers trained in Minicourse I. Post-course evaluation showed that the subjects were significantly above their pre-course levels in ten measurable behaviours. After 39 months they were still superior to pre-course levels in eight of the behaviours.

17. BROWN, A. (1971). Cost effectiveness models in microteaching. Unpublished pape
The problems of measuring changes in distribution and value of output, measuring differential gains, and analysing component parts of the new technique, are outlined in this article. Plans procedures and problems involved in such a cost-effectiveness comparison with the old technique are given. Also the author lists some of the costs for both techniques.

18. CAMERON, W.A. and COTRELL, C.J. (1970). Remote feedback techniques for in-service education. Assessment of microteaching and video-recording in vocational and technical teacher education. Interim Report.
A study of remote teacher education to determine its feasibility and its most appropriate form of feedback. Thirty-nine in-service vocational teachers were randomly assigned to three microteaching treatment groups receiving video-phone, video-mail and video-self-evaluation feedback. The dependent variable was pre- and post-tests scores on the skills of introducing a lesson, questioning and demonstrating a manipulative skill. A satisfaction scale, a teacher mannerisms score and a questionnaire from participants gave further information.

Within groups, no significant differences were found between pre- and post-test scores for questioning in the video-phone group and for introducing a lesson and questioning in the video-mail group. All other differences significant. No between group differences were found in satisfaction. However video-mail and video-self evaluation groups made more positive changes in teacher mannerisms. Participants reactions revealed advantages for all three feed backs. The feasability of remote in-service teacher education with self-administered feedback was demonstrated.

19. CLAUS, K.E. (1969). Effects of modelling and feedback treatments on the development of teachers' questioning skills.
The author hypothesized that cueing by supervisors during modelling and feedback sessions would enhance the component skill of high-order questioning. The treatments used were modelling presented via videotape, practice teaching with videotaping and self-view feedback, with supervisory cueing as the dependent variable.

Criteria was the difference in the number of high-order questions in the first and last session as counted by trained raters using typewritten transcripts of the lesson.

Two-way analysis of variance and analysis of co-variance showed a significantly higher frequency in the last session for the cueing during modelling group. No significant increase was produced by cueing during the feedback session. The group who received cueing in both modelling and feedback sessions showed the greatest increase (in high-order questioning,) but the differences in ranking of the treatment groups were not statistically significant.

The correlation between teacher high-order questions and pupil high-order questions was also studied, a significant negative correlation being found in the final teaching session for the no-cueing group. All groups showed the same trend in this session. Taking into account limitations of small sample and low-frequency data, the author concludes that:- "Results of the present study generally support the hypothesis that cueing model presentation would help beginning teachers focus on specific behaviours to be learned."

20. CODWELL, J.E. (1969). Demonstration of the effect of an adaptation of microteaching on the instructional behaviour of rural school teachers.
Research designed to evaluate an adaption of microteaching to rural centres taught groups of twenty-three pupils for twenty-five minutes during a twelve week teaching laboratory. Video tape recording was used for self-feedback and peer-instructor feedback. Pre- and post-ratings for competence interaction and attitude were made for actual and microteaching performance with the Stanford Teacher Competance Appraisal Guide, Ryan's classroom observation record and the Minnesota Teacher Attitude Inventory. Significant improvement was shown in all three centres on the three dependent variables but with between factor and between-centre differences. Actual and microteaching raters tended to agree. No significant differences resulted from variables of sex, levels of teaching and teaching experience.

21. COOPER, J.M. et al (1973). Specifying Teacher Competencies.
One of a series of papers presented at the 1972 annual conference of AERA. The general topic was 'Are there basic skills of teaching?' The authors consider the problem from the point of view of a competency-based teacher education programme. Several issues related to the specification of teacher competencies are considered. They consider more the process of defining competence without actually identifying any.

22. COOPER, J.M. and ALLEN, D.W. (1970). Microteaching : history and present status.
This article was prompted by the growing use of microteaching in America without due regard to its validation through research. It defines the process, outlines its history and lists twelve points of rationale as made by authors in the field. Various applications are discussed including pre-service, in-service, microcounselling and supervisor training, with detail of the processes involved and examples of their application. It outlines evidence of the effectiveness of microteaching and its various elements, concentrating on the experience of others more than empirical research. A summary of those research findings is also included and areas requiring further research are discussed. An appendix lists and describes teaching skills and an annotated bibliography containing articles published up to the end of 1969.

23. COTRELL, C.J. and BICE, G.R. eds. (1969). Technical teacher education seminar proceedings : microteaching and video recording.
This volume contains seven studies on microteaching as presented to the 3rd Annual National Vocational Technical Teacher Education Seminar at Ohio State University. From all six studies no significant between group differences in improvement were found no matter what technique was being applied and in almost all cases all subjects improved significantly as a result of the microteaching experience. In the first study a series of four experiments examined teacher educator supervision on a personal or remote level with or without video feedback (and 2nd track critique) and remote supervision with video models and self-critique, all under laboratory conditions and peers versus high school pupil classes under classroom conditions. High satisfaction was subjectively expressed by participants in all techniques and in the last experiment the highest satisfaction was associated with video feedback and high school pupil classes. In the second study video or non video feedback from peer and school pupil classes were compared in short and long sessions in the light of teacher performance and level of self confidence. The subjective opinion of participants pointed to the value of pupil classes and short sessions which were considered just as effective as long sessions. The third study used remote supervision with audio-phone and video-phone methods and compared it with normal face-to-face supervision. Pre and post confidence levels and satisfaction were taken into account; time and money elements were also studied. The only between group difference was found in total hours, personal supervision being the most expensive.

The fourth study compared self, student, peer and teacher-educator critiquing. A positive opinion shown by the self-critiquing group was the only factor which led to this feedback technique being recommended.

In the fifth study, microteaching with and without videotaping was compared with conventional peer teaching and video recording of practice teaching.

Teacher satisfaction, teacher-educator opinion, and time and cost factors were included. Subjective opinion pointed to the need for video feedback with high school pupil classes although the video recording created the most expense.

The sixth study included remote feedback in an in-service setting via videophone, video-mail or video self-evaluation, all supplemented by instructional and illustrative models. Performance gains and satisfaction were equal although teacher mannerisms changed most for the last two groups. In the last study microteaching and video feedback for microsupervisors were examined in a group and individual setting. An instrument for rating supervisory skills as well as supervisory models was developed. With all studies the subjective opinions and reactions of leading participants in the institutions involved are included.

24. CYPHERT, F.R. and ANDREWS, L.O. (1967). Using the videotaper in teacher education.
A plea to place the "hardware" of teacher education in its proper perspective. Ten current uses for video recording are listed and the authors argue that such wide use of the equipment has outstripped evaluation and that enthusiasm for the new medium has not been totally justified by research based on poor design. They propose that the initial use of videotaping could be more fruitfully replaced by an analysis of the needs of particular teaching programs, and they tentatively put one forward. Seven dichotemous approaches to videotaping illustrates the complexity of the situation. Research into the economic and content aspects of education is recommended for the enhancement of this valuable equipment.

25. DILLION, R.D. and PETERSON, R.L. (1971). The influence of videotaping techniques on student-teacher behaviour in the classroom.
Prompted by the teacher talk syndrome; this study uses the Flanders system of interaction to discover if student-teacher interaction can be modified by videotape critiquing. Ten student teachers were divided into two groups one being audiotaped (not heard but critiqued) on the pre-test and one being videotaped (seen and critiqued). Both groups were videotaped on a post-test. Although the two groups showed an increase of student talk in their lessons, only the video-taped group showed a decrease in teacher talk. This latter group used more indirect teaching and interaction procedures.

26. DUGAS, D.G. (1967). Microteaching : a promising medium for teacher re-training.
A microteaching program for language teaching is described. Two cycles within the program are outlined. In the second cycle attention was focused on student reactions during sessions. Subjective reactions from participants and staff were positive.

Recommendations made include using microteaching to develop self-evaluation, which can be measured by correlation with staff evaluation, or evaluation of teacher performance by a board of specialists, each concerned with his own domain. More camera focusing on pupils during sessions is also recommended as an aid to honest self evaluation.

27. ELASHOFF, J.D. (1969). Analysis of co-variance.
A revealing article on analysis of co-variance and its use in comparing treatments. With so many studies in microteaching using this statistical procedure, the six conditions which must be satisfied for it to be a valid technique are of interest. They include random assignment of subjects to groups and no slope treatment interaction, and methods of checking data to see if they have been fulfilled are given.

28. FLANDERS, N. (1973). Basic Teaching Skills Derived from a Model of Speaking and Listening.
This is one of a series of papers presented at the 1972 AREA annual meeting. The papers deal with the question 'Are there basic skills of teaching?' Flanders attempts to analyse the elements of speaking and listening in an order to identify teaching skills basic to a teacher/pupil interaction situation. Four phases in the speaking, listening process are identified and attempts are made to consider the skills within each phase.

29. FORTUNE, J.C., COOPER, J.M. and ALLEN, D.W. (1967). The Stanford summer microteaching clinic, 1965.
This article describes the pre-internship microteaching program at Stanford

University in 1965, the technical skills taught, and the criterion measurements used. The program was judged to be a success, but the ability of the Stanford Teacher Competence Appraisal Guide to evaluate specific skills as opposed to overall teaching performance was thrown in doubt and the need to train supervisors in the use of video-taperecorder was revealed.

30. FORTUNE, J.C. (1967). Toward a research strategy to investigate attributes of teacher behaviours.
Research into classroom teaching and practices through a microteaching format to utilize the complexities of the classroom and the control of the laboratory 3 research studies into teaching skills along these lines are described. The first used intern teachers teaching 8 groups of 5 students to ascertain the generality of the teacher ability to explain social studies material over different groups and topics. Correlations showed generality over groups only, with teacher clarity correlating highly with teacher effectiveness. In the second, 30 teacher trainees taught 2 10 minute lessons and were able to generalize their ability over content and groups. 4 success factors included providing opportunities for verbal practice and reinforcing correct responses. The third is an on-going study using elementary school teachers teaching different content. Results are not reported.

31. GUELCHER, W., JACKSON, T. and NECHELES, F. (1970). Microteaching and Teacher Training - A Refined Version.
A report of the successful refining of the Stanford approach by the University of Chicago. Problems such as poor co-ordination between skills and lesson idiosyncralic supervision unreality, gimmickry, and poor distinction of the nature of skills had been encountered in their microteaching clinic. Lack of improvement between the teach and re-teach cycles was blamed on student failure to think out their lessons. All this led to the insertion of 5 new stages in the Stanford process designed to move microteaching away from the practical approach to a position between theory and practice,
1. The practicum - to show that in a good logically structured, well planned lesson reinforcement is tied to subject matter of the lesson and applicable to the pupils experience. 2. Initial peer group microteaching - as an anxiety reduction measure. 3. Seminar in supervision of microteaching to overcome shortages in trained supervisors and leading to further student insight into lesson preparation and presentation. 4. Skills session in microteaching - a seminar on the nature of skills as dynamics of the lesson - hence the 'dynamic' rather than 'component' skills approach. 5. Microteaching experience with pupils. Here a pre-teach supervisory conference centred on the nature of the lesson and its place in a hypothetical course, skills to be examined and criteria for success.
Overall, the concept of a nuclear lesson was developed where each good lesson 'holds the nucleus of several subsequent learning experiences' and this concept is presented as the bridge between microteaching and 'real' teaching.

32. HISCOX, SUZANNE B. and VAN MONDFRANS, A.P. (1972). Feedback Conditions and Type of Teaching Skill in Microteaching.
Research to determine the effects of audio and video tape feedback on both verbal and psychomoter skills when all other aspects of the Stanford microteaching model were controlled. Questionnaires, interviews with supervisors, and student evaluation of teachers provided data for analysis. Results showed no difference in the effectiveness of audio and video tape feedback.

33. HARRIS, W.N., LEE, V.W. and PIGGE, F.L. (1970). Effectiveness of microteaching experience in elementary science methods classes.
An experiment comparing multiple microteaching with conventional single teaching experiences within a science method course emphasising the 'discovery' approach. A pre-course and post-course administration of a Teacher Behaviour Evaluation Instrument measured both personal items such as personality, approach and speech patterns and classroom techniques with peers. 48 students were formed into 3 experimental (microteaching) and 3 control groups. A "t" test at the .05 level showed no statistically significant gain scores for either group on personal items. However with both classroom techniques and combined scores both groups gained significantly, with the experimental group performing significantly better than the control on the post-test.

34. JAMES, P.E. (1970). Television in teacher training.
A report on the use of television for classroom observation. 15 student teachers were shown a 60 minute videotape from a 90 minute lesson on building electric motors to 25 3rd form boys. The formers' reactions indicated that the videotape was seen as useful in combination with, but not as a substitute for, normal classroom observation. Included is a report on the application of microteaching to the training of ship-building apprentices in Glasgow. A 5-point rating scale showed a faster improvement in a particular skill when microteaching was used. Details of the equipment used for the observation experiment and its lay-out are comprehensive.

35. JENSEN, L.C. and YOUNG, J.I. (1972). Effect of Televised Simulated Instruction on Subsequent Teaching.
A study to determine whether simulated instruction improved subsequent teaching. Subjects in the experimental and control groups were trainee teachers enrolled in the same teacher education program. The experimental groups of seventeen students undertook the additional simulation assignment consisting of microteaching a seven-minute lesson to four or five peers.

Teaching performance was measured with the Teacher Performance Evaluation Scale (Sinha, 1962), the 42 items being factors analyzed to produce six behaviour categories:- (1) personality traits, (2) warmth of teacher behaviour, (3) general classroom atmosphere, (4) lesson usefulness, (5) teacher interest in pupils, (6) teacher interest in pupil achievement. Teaching performance was measured three times during an eight-week teaching round, and it was found that the experimental group achieved higher scores on the first five factors, although this superiority was sometimes not evident until the third measurement (after six weeks of teaching).

36. JOHNSON, J.A. and TETTEMER, R. (1970). The use of portable videotaping equipment in teacher education.
A 37 item instrument called "The Role of a Supervisor of Student Teaching" was administered to 224 students starting a microteaching course to discover their exact expectations. Principle axis factor analysis showed 3 strong rotated factors an instructional expectation factor, an unhampered practice expectation factor and a group sharing of experiences expectation factor. The author concluded that "after some instruction in the fundamentals the students want to learn to do their own thing" which more closely approximates the non-directive style of supervision.

37. JOHNSON, R.E. (1968). The effects of prompting; practice and feedback in programmed videotape.
A study designed to test the optimum method for teachers to observe pupil behaviour through a videotape. 84 randomly selected beginning teachers were divided into 4 treatment groups. Group I were shown 21 short pupil-teacher interaction scenes, given instructions, prompts, overt practice and immediate feedback. For Group II the prompt practice and feedbacks were omitted. Group III were given a lecture on observing intended pupil behaviour. Group IV received no experimental treatment.

An analysis of variance showed significant between-group differences at the .001 level on a 21 item multiple choice test. Duncan's New Multiple Range Test showed the mean of Group I to be significantly greater than the mean score obtained in any other group indicating the benefit gained when prompting and practice and feedback accompanies observation. The fact that Group III significantly out-performed Group IV indicated that a lecture is better than no treatment al all.

38. JORDAN, F.R. (1971). Teaching Teaching - A report on two programs.
A detailed description of the 1970 and 1971 physical education teaching programs at Sydney University. Both were designed to induct students gradually into the teaching situation but emphasis on isolated teaching skills in 1970 gave way to a more structured hierarchial program in 1971 ranging from "skills" at the base to general plans and strategies at the highest level. Also an adherance to microlessons in 1970 was followed in 1971 by a growth in the class size during the program to allow for different instructional behaviours in large group situation. The schedules skills and strategies taught in both years are outlined.

Evaluation was based on questionnaires and teacher ratings. Both years showed a clustering in their distribution around the "satisfactory" category, and poor transfer to large group teaching in terms of organisation and control. Also in 1971 a difficulty in applying general strategies to specific situations was suggested. But in both a higher instance of confidence during practice teaching was shown.

39. KALLENBACH, W.W. and GALL, M.D. (1969). Microteaching versus conventional methods in training elementary intern teachers.
A comparison between microteaching and conventional techniques of teacher training by evaluation in both situations. 37 elementary school interns formed 2 treatment groups. The microteaching group gave 20-25 hours of their time, the conventional group gave 125 hours. The Stanford Teacher Competence Appraisal Guide was used to rate pre and post treatment 5 minute microlessons and post treatment classroom teaching. The instrument for the Observation of Teaching Activities was also used for the latter in the same and in the following year. T. tests showed no significant differences between the groups in any post treatment ratings and adjustment for significant pre-treatment ratings differences did not produce significant results. Discussion in the article takes into account the time differences between the two programs. Of interest is the indication that the STCAG applied to videotaped microlessons is a good predictor of teaching effectiveness. Students exhibited stability in teacher effectiveness over and after the training period.

40. KORAN, J.J. (1971). A study of the effects of written and film mediated models on the acquisition of a teaching skill by preservice elementary teachers.
This studies the ability of written and film-mediated models to generate written observation - classification questions by 31 undergraduate education majors. Subjects' written questions were rated on 3 trials. Although the film group outperformed the written group a significantly lower score for the latter on the pre-test precluded between-group differences conclusions. A one-way analysis of variance showed both experimental treatments producing significant changes whereas a control group did not.

41. LANGER, P. (1969). The range of teaching skills that can be changed by the minicourse model.
This describes a typical minicourse, and the procedures followed for developing, revising and validifying it. This is illustrated by the successful development of the minicourses 1, 3, 8, 5 and 2 and the shifts in teacher behaviour produced by them. An appendix gives the instructional sequences for these minicourses and the main field data obtained for them.

42. LANGER, P. (1969). Minicourse : Theory and Strategy.
This article explores teacher training programs in general and the minicourse specifically. It is felt that the former should divide its outcomes into behavioural responses and conditions under which they are emitted, as well as distinguish between pupil and teacher behaviour.

A valid training operation should specify all input needed. Also, evaluation should take place with specified input. The minicourse is seen as meeting these issues where outcome is anticipated by input.

The instruction materials and activities which make up the input of the minicourse and the problems involved are described. The evaluation of the minicourse is seen as a never ending process in terms of teaching behaviour and pupil reaction.

43. LEGGE, W.B. and ASPER, LOIS. (1972). The Efect of Videotaped Microteaching Lessons on the Evaluative Behaviour of Pre-Student Teachers.
The purpose of the study was to ascertain the extent to which participation in videotaped microteaching lessons by junior-level students of education enhanced their abilities to evaluate teaching behaviour. Both the control group (88 students) and the experimental group (26 students) were participating in student teaching for two hours each week. The experimental group had five microteaching lessons over fourteen weeks. These lessons were short (up to fifteen minutes) with five or less pupils and a very narrow lesson purpose. Each subject evaluated her own lesson using specially structured forms; no lessons were discussed with supervisors until final evaluations were completed

At the end of the period, a forty-five minute tape of a teaching lesson was viewed by the experimental and control groups, and by four master teachers who were specially selected on the basis of quality service. All subjects evaluated the tape using the first eleven items of the Stanford Teacher Competence Appraisal Guide.

The results showed a significant difference between the mean evaluations of the experimental and control groups for all categories tested. There was striking similarity in the scores of the master teachers and those of the experimental group in total evaluation, and in the category of lesson presentation. In the areas of aims and lesson planning this was less apparent. The authors conclude that microteaching hold great promise for working with trainee teachers.

44. LEONARD, B.C., GIES, F.J. and PADEN, (1971). The effect of selected media feedback upon the interactive behaviour of student teachers.
A comparison of the effect of added audio feedback, added audio feedback plus video feedbacks and normal supervisory feedback alone on verbal teaching behaviour. 12 student teachers were assigned to 3 experimental groups. Pre and post videotapes of all students teaching were coded according to the Flanders Verbal Interaction System. The Wilcoxen matched pairs signed ranks test aided by the Kruskal Wallis one-way analysis of variance showed significant gain scores in 'indirect teaching influence' and 'student talk' for the video feedback group only, although the differences in the magnitude of change between the 3 groups was not statisitcally significant.

45. LETT, W.R. (1971). Some difficulties of role adoption for the beginning teacher.
A 6 month microteaching program with 24 graduate teacher trainees at Latrobe University was subjected to intensive research to discover difficulties encountered by students in appropriate role adoption. Analysis was based on a 3 part self-rating scale, a descriptive qualitative analysis derived from the Bass Orientation Inventory Manual as well as measures of motivation. The program involved 2 simulated (with videotape) and 2 actual (without videotape) teaching experiences. Results showed student difficulties in objectively assessing and operationalizing a set of teaching concepts, failure of the supervisory feedback to adequately assist the student, student teaching faults including teacher-centred instruction, little attention to testing, low cognitive level of testing and questions and lack of clarity. The failure of the microteaching program to combat the professional content-control approach at the expense of interaction with pupils is thus implied.

46. LIMBACHER, P.C. (1971). A study of the Effects of Microteaching Experiences Upon the Classroom Behaviour of Social Studies Student Teachers.
A report on an experiment at the Teaching Techniques Laboratory at the University of Illinois to discover the effect of microteaching experiences on classroom teaching behaviour. Two groups of 25 social studies student teachers were involved, one experiencing 6 to 9 microteaching sessions of 10 minutes to high school students or college freshmen and one acting as the control. The teacher performance Appraisal Scale administered on 2 traits for pupil evaluation tended to show the superiority of the experimental group. The Illinois Teacher Evaluation Questionnaire given during the program again for pupil evaluation showed the experimental group being rated significantly higher. The hypothesis that the experimental group would be judged by their teachers to be ready earlier to assume full responsibility for classroom instruction, was not supported. Flanders interaction analysis also showed no difference in the Direct/Indirect Ratio but an experimental error affected this result.

47. McALEESE, W.R. and UNWIN, D. (1971). Microteaching: a selective survey.
A survey of microteaching supported by selected research studies. Apart from its development and description aspects dealt with include the supervisor - his role, faults, and negative aspects related decisions as to sex, subject matter, level of experience etc., evaluation instruments their criteria and conditions. The applications of the microteaching format are listed and suggested areas for further investigation are test instruments, protocol, supervision and modelling.

48. MacCOLLUM, R. and LADUE, D. (1970). Microteaching in a teacher education program.

A description of EPICT: The Elementary Program for Inner City Teachers, Temple University, Philadelphia, which uses microteaching to add realism to the overall course. The specific teaching skills taught are listed and two types of microsessions illustrate the procedures involved.

49. McCOMBS, M.A. (1967). Chicago's Television College (Economics of) in New Educational Media in Action; Case Studies of Planners.

A cost breakdown in terms of output for the Chicago Television College (Economics) with implications for developing countries.

50. McDONALD, F. and ALLEN, D.W. (1967). Training effects of feedback and modelling procedures on Teaching Performance.

A detailed description of three experiments from which the authors concluded that the provision of reinforcement and discrimination training will significantly improve the performance of student teachers in the acquisition of a skill; that there appears to be no optimum combination of distributing practice and feedback in a microteaching program and perceptual modelling is more effective than symbolic modelling with the optimal combinations of presentation and feedback being strong symbolic and maximal perceptual modelling with prompting and confirmation feedback.

51. McINTYRE, D. (1971). Three approaches to microteaching: an experimental comparison.

This study investigated two ways of reducing the cost of microteaching. These were the use of peer feedback and the grouping of students into 3, one actually reteaching and 2 observing planning and analysing only. 130 students were involved in a teaching course based on 5 teaching skills. For the first skill all received supervisor feedback and reteach. For the second skill no supervisor feedback was given. Experimental comparisons were made on the last three skills. One group of 12 practiced individually with supervisor and reteach. One group was divided into groups of 3 working with supervisors but only 1 student in each actually reteaching. The last group, did the same but without supervisor feedback.

Results in terms of teaching behaviour were assessed by a 2 way analysis of variance. For students working in groups supervisors did not affect performance. Over all groups there was some evidence of the superiority of reteach groups. Those working individually with supervisors were significantly better than those working in groups without supervisors.

No between groups differences in ability to evaluate teaching came from supervisors. In this ability differences favoured group work on two out of thirteen variables. Responses to Questionnaires showed students working both individually and with tutors were evenly divided as to which was superior. Those who worked with supervisors had a more favourable attitude toward teaching.

Overall, results were considered disappointing in terms of justifying the more economical approach to microteaching.

52. McINTYRE, D. and DUTHIE, J. (1971). Students' Reactions to Microteaching.

A report of questionnaires administered to students over a period of 4 years, the course in Education being adjusted by the experience gained the year before.

Different microteaching skills were seen as needing different lengths of lesson, with the preference tending toward the longer lesson. Estimates of time for replanning also varied according to skill being taught, with the average one hour. This was used to justify a split cycle of the teach-reteach pattern. Preferences tended toward a spread out course rather than a 4 week block of microteaching. Most students in the first two years found difficulty in concentrating attention on specific skills and in the 3rd and 4th years more than half reported some difficulty. Tutors were seen to be more valuable than work with peers.

The basic components of microteaching models reteach and particularly videotape playback were the most valued parts of the course. Students felt that relating psychological theory to skills was not emphasised enough.

Other questions dealt with the effects of the course on students. Preference expressed overall were generally in line with research into the most effective variables.

53. McINTYRE, D., McKNIGHT, P. and WHITE, D. (1972). Diagnostic Assessment of Teaching Skills.
A detailed description of 6 teaching skills observation instruments developed at Stirling University as an improvement on the evaluation type Stanford rating scales and as a substitute for normal supervisory interpretations and judgements. The 6 skills are varying the stimulus, reacting, questioning for feedback, higher order questioning and probing, clarity of explanation, and use of examples. For each observation instrument the paper gives a definition of the skill, the observation procedures, an interpretation guide and tentative reliability figures. Overlap between skills is admitted and in fact considered desirable for the variety of perspectives gained.

54. McKNIGHT, P.C. (1971). Microteaching in Teacher Training: a review of research.
A review of research which divides aspects of microteaching into setting and equipment, participants, teaching skills and programmes. The bulk of the article concerns the components of modelling, feedback and supervision. For modelling the author concluded from research evidence that videotape models are effective additions to a programme, particularly with accompanying commentary. He sees feedback as best presented utilizing both videotape recording and supervisory critique. A redefinition of the role of the relative effectiveness of modelling and feedback of the supervisor is cited.

55. McPHERSON, J.J. (1971). Recent developments in Research on the Use of Audio-Visual Media in Teacher Education in the United States.
This article includes brief sections on microteaching and the minicourse. The Perlberg studies of 1968 are cited as evidence of the value of microteaching but the hurried use of it before adequate research is suggested by a study by Reed (1970) which showed a greater increase in teaching skill but a parallel decrease in favourable attitudes to teaching. The principles of the minicourse are described and some of the ones available are listed. Developments in simulation approaches are discussed in the bulk of the article.

56. MEIER, J.H. (1968). Rationale for and application of microteaching to improve teaching.
The author has coined the term microtraining to widen the scope of microteaching. Examples of microteaching projects given include those conducted by the Rocky Mountain Educational Laboratory (remote: learning disabilities) and the Jefferson County public school system (Colorado; in service). Applications of microteaching given include remedial work for in-service teachers.

57. OLIVERO, J.L. (1970). Microteaching: medium for improving instruction.
This book is designed to give students a 'capsule presentation' of the concepts involved in microteaching.

58. OWENS, L. and HATTON, N. (1971). Telling it Like it is.
A frank and detailed account of the 1970 microteaching project at Sydney University. The student experience in microteaching was supported by situational teaching and a curriculum course and teaching skills were measured by a Skill Observation Record (SKOR). On the more or less subjective evidence of a survey and teacher competence observation record, the skills were seen to transfer to the normal classroom situation.

59. PERLBERG, A. et al (1971). Studies on the use of videotape recordings and microteaching techniques to improve on university teaching.
A report of a study on microteaching in higher education and particularly on statistical results for his Israel study which arose out of the experience gained from the former. Firstly, when evaluated as a motivating force for behavioural change when used as a self confronter, the videotape recorder was found to be effective in both studies. As an evaluation of the microteaching process in the Israel study, pre and post tests showed statistically

significant improvement on each of 7 teaching skills. The relationships between attitudes and acceptance of behavioural change was also studied, with perseverance and attitude to the concept of microteaching in that order being the best predictors.

60. PERLBERG, A. and O'BRYANT, D. (1970). Video-recording and microteaching techniques to improve engineering instruction.

A description of the application of microteaching techniques to the field of engineering instruction. Three faculty members and a specialist in education studies assisted 12 senior faculty members on both an individual and group model exhibiting a positive and desirable change in teaching behaviour. Aspects studied included motivation of staff members and the professor consultant relationship. The combination of individual and group approaches is recommended with sufficient attention to motivation and length of program.

61. PERROT, E. and DUTHIE, J. (1970). Television as a feedback device: microteaching.

A general article on microteaching and on CCTV as a device to allow student and tutor to share a common experience. The difficulties include the problem of what is "good" teaching and the need to distinguish teaching behaviours. The authors describe attempts to do the latter at Stanford and continue with a description of the Stirling course with its integration of microteaching into a theoretical course. The equipment and organization of this system are given in detail. Student response to the system is seen as encouraging.

62. PFEIFFER, ISOBEL L. and REIGHARD, RICK (1971). Micro-Teaching Practicum in Teacher Education.

Description of a program commenced in 1968 at the University of Akron in which the undergraduate student teachers are supervised by graduate students who also videotape and analyse their own supervisory performance and that of their fellow graduates.

63. POLITZER, R. (1969). Microteaching: a new approach to teacher training and research.

A general article on microteaching, its various elements and the possible variations within those elements with particular emphasis on teaching foreign languages. The most desirable combination of variables from Stanford Research evidence is put forward and research into the value of various teaching strategies is recommended.

64. REED, C.L., VAN MOND FROINS, A.P. and SMITH, I.M. (1970). Effect of microteaching, directive and non-directive lectures on achievement and attitudes in a basic educational psychology course. Effect of mode of feedback in microteaching.

All combinations of directive lectures (5 on specific skills) non-directive lectures (5 on interpersonal relationships) and microteaching (5 with 5-10 minute lessons) were compared in a 2 x 2 x 2 factorial design to gauge the effect on teaching skill and attitude toward educational psychology and microteaching. 87 undergraduate students were randomly divided into the 8 experimental groups. Student response was gauged by a 56 item evaluation form and teaching skills were evaluated by peers with the standford Teacher Competence Appraisal Guide. The statistical procedure used was a 3 way Analysis of Variance with unequal cell size. Both microteaching and directive lectures were effective in improving teaching skills. Only the 2 types of lectures led to more positive attitudes towards the course. Paired treatments particularly non-directive lectures and microteaching, tended to lessen possitive attitude and lower scores in teaching skills. 3 treatment groups showed strong favourable attitudes but not the corresponding strong performance.

65. SALOMON, G. and MACDONALD, F.J. (1968). Pre and Post test reactions to self-viewing one's teaching performance videotape.

A study to determine the effect of initial self-viewing of a videotape in terms of teachers cue selection and attitudinal changes and their relationships to self-satisfaction when no modelling, cueing or guiding is given. 38 interns taught a 50 minute lesson to 25 5th and 6th grade pupils and viewed the videotape alone. Before and after the self view they were interviewed and administered an attitude questionnaire. Statistical procedures used were Analysis of variance, Scheffe's method of Paired comparisons and Dixon and Masey's

Rank-sum test. Interns were divided into high and low self-satisfaction groups. Attitudinal changes and cue selection were found to be clearly related to self-satisfaction, that is when no model is given the only feedback being received is that related to the subject's own expectations. No control group was used.

66. SHAVELSON, R.J. (1973). What is the Basic Teaching Skill.
One of series of papers presented at the 1972 Annual Conference of AERA. The general topic for discussion was 'Are there basic skills of teaching?' Shavelson argues that the skills such as questioning, reinforcing, explaining etc. are but alternative acts which the teacher can select from in making a decision as to how to proceed in the teaching act. The author concluded that the basic teaching skill is decision making.

67. SHIVELY, J.E. et al (1970). Effect of mode of feedback in microteaching.
This study compares 4 types of supervisory feedback on videotape, audiotape, live lesson or the Stanford Teacher Competence Appraisal Guide. 37 educational psychology students were randomly assigned to 8 groups, 2 groups per treatment, and each participated in a microteaching experience. The teach and reteach scores on the STCAG were used as the covariate and the criterion in an analysis of covariance (Winer 1962). The teach and reteach scores on an attitude scale were used in an analysis of variance. In terms of teaching performance (STCAG) the audiotape was the most effective, the live lesson least effective. The STCAG was also effective in producing change. In terms of attitude the audiotape and videotape groups were significantly higher. The author concluded by recommending the less expensive audio feedback.

68. SHORE, B.M. (1972). Microteaching: A Brief Review.
A general description of microteaching with a typical sequence, the variables such as skill emphasis length of lesson studies on the carry over of microteaching and the advantages and disadvantages as put forward by Allen and Ryan (1969), Craig (1969), Kallenbach and Gall (1969) and Borg (1968-70). He disputes Borg's implied criticism of microteaching by his development of the minicourse with its emphasis on structured self evaluation rather than supervisory feedback.

69. SHORE, B.M . (1972). Some Applications of Microteaching in Higher Education.
A short article which lists 4 main applications of microteaching and illustrates its flexibility by describing one course in second languages showing how the procedure was adapted to suit specific needs.

70. SORENSON, G. (1967). What is learned in practice teaching?
An impromptu instruction to "list the things you would tell your best friend to do in order to get a grade 'A' from your present training teacher" was given to 163 secondary education students after 8 weeks of practice teaching. Responses related to 9 classified areas, the 3 most common being student - supervisor relationship lesson preparation and classroom control.

Ambiguity of language, cynicism and hostility were featured. Apparently differing supervisor concepts concerning the teachers role leads to attention to non-instructional variables. A gap between theory and student activity was evident with theory not playing a part in practice teaching. Conclusions for teacher training procedures are made.

71. STEWIG, J.W. (1970). What should college supervisors do?
A study of student teacher and supervisor perception of the role of the ideal supervisor. Questionnaire relating to practices in supervision and quality of supervisors was administered to 641 elementary and secondary major students and 67 supervisors. Secondary and elementary showed similar responses. Only the supervisors were receptive to the idea of the supervisors as an affector of perceptions and an agent of change.

Elementary groups saw the co-operating teacher as the most satisfying aspect and for secondary groups it was the children. Over all, student and supervisors perceptions differed, in particular in regard to systems of analysis which were important to the supervisor only.

72. SUSSMAN, H. and SMITH, H. (1970). Sensory Feedback modes as Determinants of Learning and Memory.

The effect of 4 types of sensory feedback on learning and memory were compared using a computer controlled oscillograph. The feedbacks were active or passive, visual or non-visual, the latter being a compensatory or negative feedback. The Neuman-Keuls range tests, and a 5 way analysis of variance were carried out on differences in a memory test. The compensatory feedback was the weakest learning mode and the active visual modes were just as good as the purely visual modes.

73. TRAILL, R.D. (1971). The effects of Using Interaction Analysis as a Means of Assisting Student Teachers to Analyse Teacher Behaviour.

This study evaluated feedback on interaction analysis for self-evaluation as a means of overcoming the barrier to communication created by the supervisory evaluation. 54 elementary student teachers and their supervisors were instructed in the Berkeley modification of the Flanders Interaction Analysis system (BIAS). During student teaching students formed a control and an experimental group, the former being given the analysis feedback. Results were based on BIAS observation procedure (15 categories and 3 ratios), pre and post tests of the Teaching Situation Reaction Test (TRST - attitude to teaching process) and of the Adjective Check Test (ACL - values regarding the ideal teacher). The TRST scores showed the treatment group improving significantly as measured by t-tests. Multi-variate analysis with the T^2 test on the ACL showed no significant difference had occured. On the BIAS scores muntilvariate analysis revealed a significant f-ratio univariate tests on the categories showed 12 being significantly different. All 3 ratios were significant on multivariate analysis with the T^2 test. Overall, the treatment group changed significantly toward indirect teaching behaviour and supervisors were more analytical and less evaluative. However, not all students positively approved of the Interation Analysis procedure.

74. TUCKMAN, B.W. (1970). A technique for the Assessment of Teacher Directiveness.

The student perception of teacher style (SPOTS) was developed to measure teacher directiveness as a more efficient alternative to the Flanders and OSCAR systems and a test of its reliability and validity is reported on. The SPOTS, a 9 point 32 item rating scale focussing on intensity or frequency of specific behaviours rather than evaluative dimensions was administered to the students of 22 male teachers. Two parallel scales, the Observer Rating Scale (ORS) and the Teacher Style Checklist (TSC) were completed by observers. Pearson product moment correlations, item analysis and factor analysis were the statistical procedures used. Internal consistency was established, inter-judge reliability was high, correlation between SPOTS and ORS was high and correlation between SPOTS and TSC was moderate. One major factor in SPOTS was identified.

75. TUCKMAN, B.W., KENDRICK, M. and HYMAN, R. (1969). The modification of Teacher Behaviour: Effects of Dissonance and Coded Feedback.

A study of the effect of dissonance on self-perception and behaviour in a 4 x 2 factorial design involving four types of feedback, audio tape and control, and two degrees of magnitude of discrepancy between self-perception and observed behaviour.

The behaviour of 24 in-service high school teachers was coded by the Flanders system, scores being obtained on 5 category combinations and teachers completed the self perception inventory based on time devoted to Flanders categories. Both these were on a pre and post treatment basis. A percentage discrepancy score between self-perception and feedback information was also obtained. Analysis of variance showed high discrepancy groups changed their discrepancy scores significantly more than low discrepancy groups with only verbal feedback groups changing their score significantly more than the control. In terms of perception high discrepancy led to a significant change. In terms of behaviour verbal feedback led to a significant change. Teacher behaviour and self perception was changed by discrepancy and thus dissonance.

76. TUCKMAN, B.W. and OLIVER, W.F. (1968). Effectiveness of feedback to teachers as a function of source.

A comparative study of the source of feedback taking into account teacher experience. 286 in-service teachers were given student feedback, supervisor feedback, both or no feedback. Information from this questionnaire was also used to determine change in teacher behaviour. In a 3 x 2 x 2 analysis of variance for the total change scores factors were student feedback (2-present or absent), supervisor feedback (2) and level of experience (3). Only the student feedback factor had a significant effect and no interactions reached significance. When the four feedbacks were compared using the Duncan Multiple-Range Test it was seen that student feedback and both were statistically comparable. Adding supervisor feedback did not generate further change and when given alone led to negative change.

77. TURNEY, C. (1970). Microteaching: a promising innovation in teacher education.
A description of the 1969 Sydney University Education Microteaching Project based on procedures and principles developed at Stanford University. The facilities and equipment included the outside broadcasting van transported to a preparatory school. Each of 10 final year students taught pupils from Grade 1 up to Grade 6 during the morning and viewed the tape in a group discussion context in the afternoon. Students practiced 10 teaching skills using specific curriculum suggestions. Rating scales were devised for each skill. A comprehensive scale showed substantial progress for most students in teaching skills, teacher-pupil progress for most students in teaching skills, teacher-pupil relationships etc. Students judgements were most favourable and their comments and suggestions are included. As a result of these a collection of models of various skills was made. The wider implications of the project included microteaching as a context for integration of theory and practice in teaching.

78. TURNEY, C. et al (1973). Microteaching: Research Theory and Practice.
This book has been written principally for the Australian scene. The first three chapters provide a review of microteaching research and the effectiveness of the teaching skills approach as well as a survey of the use of microteaching in Australia. This is followed by a useful discussion on problems of programme implementation. Of particular interest is the list of teaching skills with the research studies, theoretical formulation and development work relevant to each skill.

79. VLCEK, C.W. (1970). Portable VTR Application Technique.
Discusses the technical problems involved and ideal physical arrangements for setting up television equipment for videotaping classroom activities in the light of its various applications, particularly physical education.

80. WAIMON, MORTON, D. et al The Effects of Competency-Based Training on the Performance of Prospective Teachers.
The paper reports testing of a treatment designed to help trainee teachers perform pretutorial teacher behaviour (lesson planning, etc.). The treatment is termed MICROPLANNING; it consists of six competencies - rationale, behavioural objectives, knowledge structure, selecting content, teaching methods and teaching actions.

The experimental group consisted of ten volunteers who took a sequence of three courses - microplanning, microteaching and clinical teaching. The control group of ten students were matched with respect to sex, class, G.P.A. and hours of university credit; they took the regular teacher education sequence with the same number of hours as the experimental sequence. At the end of the sequence each student gave four half-hour lessons to a group of five-to-ten pupils and administered a test measuring both recall and ability to reason with the material. The experimental subjects also completed the Minnesota Teacher Attitude Inventory and Teacher Role Preference Inventory on a pre- and post-test basis.

Test results showed that pupils taught by the experimental group scored better on questions relating to ability to reason with the material than did pupils taught by the control group (there was no difference between the groups on questions testing recall). As was expected, attitudes as measured by the Inventories were unchanged. The authors conclude that microteaching, unless preceded by successful performance in microplanning, could be a case of misplaced emphasis.

81. WAIMON, M.D. and RAMSEYER, G.C. (1970). Effects of Video Feedback on the Ability to Evaluate Teaching.
Video feedback can focus on pupils from various angles or on the teacher or both. It was hypothesised that on a conyinuum from no feedback to the

maximum teacher focussed feedback the latter would be superior in terms of ability to evaluate teaching. Supervisory and audio visual feedback were also compared. 40 subjects formed 4 randomly assigned treatment groups and taught 5 microlessons over 8 weeks. A control group received supervisory feedback. One experimental group received pupil focused audio visual feedback. One group was given pupil-teacher focused audio visual feedback. A final group was given teacher focused audio visual feedback. The criterion was an agreement score between student and laboratory teachers ratings on the Stanford Teacher Appraisal Guide. An analysis of variance on the experimental groups showed no differential effects from type of video feedback. A Dunnett's t-test between each experimental group and the control showed no differential effects from supervisor or audio visual feedback. The null hypothesis could not be rejected.

82. WARD, B.E. (1969). A Survey of Microteaching in Secondary Education Programmes of all N.C.A.T.E. Accredited Colleges and Universities.
Of 442 colleges and universities surveyed 176 used microteaching and of these 141 answered a comprehensive survey and formed the basis of the figure given. Findings are in terms of numbers of percentages and relate to curricular structure, how it was altered to incorporate microteaching and what modifications to the Stanford format took place. The most common method of modifying curricula was to condense the course content. Other aspects dealt with include the formats used, personnel numbers, use of VTR, composition of critique sessions, sizes of classes, time spent, skills considered most important and skills most used, and the effects of microteaching on the attitudes of student teachers and supervisors.

An overall trend discerned was for microteaching to be incorporated into general and subject methods courses. Most programs were conducted by education or audio visual departments using peer groups. A widespread lack of knowledge about the technical skills of teaching emerged.

83. WEBB, C. et al (1968). Description of a Large Scale Microteaching Programme.
A large scale microteaching programme at Brigham Young University is described in terms of its elements, a typical session and its equipment facilities and logistics. Problems of large numbers of students are overcome to some extent by students scheduling their own 30 minute microsessions with 3 or 4 peers and with limited reteach opportunities.

84. WEBB, J.N. and BROWN, B.B. (1970). The Effects of Training Observers of Classroom Behaviour.
The effect of training a classroom observation system called the Teacher Practices Record (TPOR) is measured in terms of observation scores. The system if based on agreement - disagreement of instructional practices with John Deweys experimentalism. A study of Beliefs, consisting of the Personal Beliefs Inventory (PBI), the Teacher Practices Inventory (TPI) and Rokeachs Dogmatism Scale, when administered beforehand to the 36 experienced elementary teachers showed these subjects to be unsympathetic to experimental theory behind the TPOR. Over the 5, 2 hour training sessions subjects showed fairly high reliability as measured by inter-observer agreement but validity in terms of observer-trainer agreement was not high. Where trainers tended to give low TPOR scores these observers tended to see more instances of both experimental and non experimental practices. The effect of attempts to increase validity was gauged using a specially developed criterion score for each film. The validity coefficients gained indicated that these attempts were ineffectual. Subjects also showed low stability in observation scores. Those with relatively high validity tended to have relatively higher stability. Overall, agreement between observers was found not to be an adequate criterion for unsympathetic observers.

85. WERNER, EDWENNA R. et al. The Minicourse as a Method for Training Teachers to Stimulate Divergent Thinking.
Fifty-nine students took part in a course training teachers to encourage divergent thinking. Teaching skills were acquired equally well by teachers who received audiotape feedback for their microteaching and by those who received videotape feedback.

86. WOOLSCHLAGER, R.C. (1970). Microteaching for Pre-service and In-servie Teacher Preparation.
A general discussion on microteaching as the most important innovation in

teacher education this decade. The article defines and describes microteaching in terms of the variety of ways it has been used, particularly in regard to teaching business subjects. The innovation of negative teaching tapes is described and the value and best ways of presenting microteaching are discussed.

Teacher behaviours which cannot be evaluated through microteaching are listed and seen as preventing full evaluation through microteaching alone. Equipment for future methods classrooms is described with regard to the trend toward individual classroom operation.

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PART D

1. A Survey on the Use of Microteaching In Teacher Training Institutions Within the Greater Melbourne Area.

2. Microteaching Seminar Report

A SURVEY ON THE USE OF MICROTEACHING IN TEACHER TRAINING INSTITUTIONS WITHIN THE GREATER MELBOURNE AREA

J.C. CLIFT & J.I. MALLEY
HIGHER EDUCATION RESEARCH UNIT
MONASH UNIVERSITY

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A SURVEY ON THE USE OF MICROTEACHING IN TEACHER TRAINING PROGRAMS IN THE GREATER MELBOURNE AREA

J.C. Clift & J.I. Malley

This survey on the use of microteaching in teacher training programs provided by tertiary institutions in the Greater Melbourne area has been undertaken as part of a larger research study on the cost/effectiveness of microteaching currently being carried out by the Higher Education Research Unit at Monash University.[1]

During the interview program and the analysis and interpretation of data, a lack of conformity in word usage between all those engaged in the field of microteaching presented itself as a rather serious problem in meaningful communication. This use of loosely defined terminology is also to be found within the research literature. The inconsistent substitution of what appears to be synonymous words creates much confusion when interpreting an author's actual meaning. For example, Cooper and Allen (1970) interchange the words "techniques" and "skills", (p. 2-3) and under the heading "Teaching Skills" (p. 21) identify as "skills" items which in task analysis literature could be classified as tasks, duties or elements of the teaching act; while in another article Allen and Ryan (1969, p.2) distinguish between "instructional skills" and "techniques of teaching".

In this report the terminology used is defined in footnotes.

What is Microteaching?

Microteaching as established by the Stanford model is orientated towards the practice of teaching tasks and elements of teaching tasks. The Stanford model emphasizes the practice of "specific teaching skills",[2] however, the tasks and elements practiced in a microteaching situation may include not only specific teaching skills, but also the presentation of new curricula and the practice of teaching techniques not covered by Cooper and Allen's list of skills (Cooper and Allen, 1970; Allen and Ryan, 1969; Berliner, 1969; Borg et al. 1969; Babin, 1969; Amidon, Amidon and Rosenshine, 1969). Microteaching is offered in both

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[1] This project is supported in part by the Australian Advisory Committee on Research and Development in Education.

[2] Skills being interpreted to mean techniques or elements of a teaching task. Our definitions are:-

Duty - an activity or part thereof performed by a teacher

Task - a unit of activity which forms a significant part of a duty

Element - a procedural step or technique involved in a task pre-service and in-service teacher training courses as a method which provides a non threat situation to teachers to enable them to obtain practice in specified teaching tasks and classroom techniques.

McAleese and Unwin (1971) present the case that there can be "no one definition of microteaching, as it is a concept which may be applied to many situations and it is certainly a developing process". While sympathizing with the difficulty of providing a single comprehensive definition of the word microteaching, there appears to be a logical inconsistency in McAleese and Unwin's case. That is, while they agree that there can be no one overall definition of microteaching, they do agree that there is a concept of microteaching. A concept, however, must have identifiable limits to be labelled a concept,[1] so that even though microteaching may not have one comprehensive definition to cover all situations it must have at least a set of minimal identifiable characteristics which are common to all "microteaching" situations. What then are these identifying characteristics of the concept microteaching and can this set of characteristics form a basis for classifying what is, and what is not, microteaching?

Allen and Ryan (1969) state five propositions which they consider to be essential to the concept microteaching.

1. Microteaching is real teaching. This proposition has led to a discussion in the literature as to whether microteaching does or does not constitute a simulation situation. Cooper and Allen (1969) believe that microteaching is a simulation of the teaching situation if peers are used as pupils. They support this stand on the basis that the peers would be role playing and that real teaching therefore does not take place. McAleese and Unwin (1970) believe that microteaching itself must be seen as a simulated situation.

   > 'the important thing, however, is that any microteaching paradigm is properly regarded as a form of simulated teaching.'

   McPherson (1971) believes that an important difference between microteaching and simulation is the lack of reproducibility of the microteaching situation.

   Whether microteaching is, or is not, a true form of simulation, it does have the characteristics common to simulation of a contrived situation providing the opportunity to learn from experience without paying the price that results from wrong decisions or poor technique in the real situation. (Craft, 1967)

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[1] concept; idea of a class of objects. (Concise Oxford Dictionary, Oxford University Press, 1964.)

2. Microteaching, by reducing class size and time, lessens the complexities of normal classroom teaching. In this manner it appears as a non threat situation to student teachers thus enabling them to concentrate on the practice of classroom techniques, gaining familiarity with them before facing a normal classroom situation. Microteaching is a 'safe' practice situation. (Allen and Ryan, 1969)

3. Microteaching is directed at the attainment of specific tasks. As established by the Stanford model, microteaching is orientated towards the practice and attainment of the teaching tasks with emphasis being placed on particular techniques or elements of a task.[1] (Cooper and Allen, 1970; Allen and Ryan, 1969; Berliner, 1969; Borg et al., 1969; Babin, 1969; Amidon, Amidon and Rosenshine, 1969)

4. Microteaching allows for the increased control of practice.

5. Microteaching provides for greater knowledge of performance. One of the principles of microteaching is to focus on a specific teaching task. This means that critique sessions have a very narrow objective and hence discussion is highly specific.

These propositions do appear to lay the foundations of a conceptualization of microteaching and set limits for a definition without such a definition being too rigid. In fact, Cooper and Allen have produced a definition which takes in propositions 1 and 2 and then accepts that variations in microteaching formats will dictate the degree and quality of propositions 3, 4 and 5. "Microteaching is a teaching situation which is scaled down in terms of time and numbers of students." (Cooper and Allen, 1970, p.1) However, it appears that Cooper and Allen do not see feedback as an essential part of the microteaching format; they state that feedback is frequently used (p.1) but do not endorse this element of feedback as essential to the microteaching format.

We believe that this definition is too general and that the essential element of feedback requires inclusion. For this study then we have defined the minimal identifying elements of the microteaching technique as "a scaled down teaching situation in terms of task, class size and time, providing for a flow of feedback to the trainee teacher of his or her performance".

Format of Microteaching

Given the above identifying characteristics of a microteaching situation, the actual structure of any microteaching program that is adopted by an institution does not necessarily have to follow an established model such as the Stanford program. Instead, the microteaching format that is adopted by any institution will in part be determined to a significant extent by :

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[1] Using Allen and Ryan's terminology the practice of "instructional skills".

(a) the purpose to which each institution applies the microteaching technique

(b) the degree of integration of the microteaching program into the overall curriculum of each training institution

(c) the administrative functions of time availability, numbers of trainees and numbers of staff

(d) the availability of physical facilities such as technical equipment and school or laboratory classrooms.

Both of the last two factors will largely be determined by the amount of available finance.

Perhaps the ideal microteaching format would take the following form:

1. The teaching of a microlesson (4-20 minutes) to a scaled down classroom setting (3-10 pupils).
2. A feedback session aimed at evaluating the teacher's performance in relation to the skill area being practiced. Feedback may come in the form of videotape, audiotape, or written/oral feedback from supervisors and/or pupils. Private self-evaluation via the use of either video or audio tapes is not excluded.
3. A replan phase of the initial lesson, based on the results of received feedback.
4. A reteach sequence of the same lesson, modified in the light of the feedback session, to a different microclass.
5. A feedback critique evaluating the reteach session. (This last stage is optional)

Given variations in style of presentation, differences in time scales and time lags between sequences and microlesson content, the above format appears to be the standard procedure of the microteaching programs reported by Allen and Ryan, 1969; Babin, 1969; Berliner, 1969; Clift, 1970; Cook and Brown, 1968; McAleese and Unwin, 1971.

Support Techniques

Assuming the acceptance of Allen and Ryan's third proposition that microteaching is directed towards the attainment of competency in the elements of specified task areas of teaching, then the use of evaluative instruments and techniques to obtain some measure of performance would appear as a matter of course.

The need of objective type evaluative instruments applies not only to the field of measuring change in performance or behaviour, but also the use of such instruments make inter temporal and inter rater comparisons meaningful and therefore more useful for research and analytic purposes.

Examples of objective type evaluative instruments used in conjunction with microteaching programs and task attainment are the Stanford Teacher Competence Appraisal Guide (Allen, 1967), technical skills instrument (Allen, 1968) and interaction analysis (Flanders, 1968; Amidon, Amidon and Rosenshine, 1969; Robinson, 1970).

Modeling

Modeling in the teacher training environment could be defined as a demonstration of a particular task, or of particular techniques to achieve skill in a specified task of teaching.

The demonstration can either be live, or on some form of tape or film, and can take place in a live classroom setting or in a controlled laboratory situation. The use of the word modeling in a microteaching situation has distinctly moved away from the use of being "teaching task" orientated to that of emphasizing elements and techniques of teaching[1] (e.g. Berliner, p.3; Allen and Ryan; Cooper and Allen; Aubertine, and Babin).

The role of modeling as presented in the literature is overwhelmingly accepted as being a desirable feature of a microteaching program ("modeling is the natural instructional counterpart of the practice dimension of microteaching", Allen and Ryan), but at the same time there exists a certain lack of definition as to exactly what tasks or elements of teaching modeling should be applied to and with what media.

Bandura and Walters (1963) and Bandura, Ross and Ross (1963) laid the foundation work by showing that complex behaviours could, to a high degree, be acquired through imitation; that is, that models could be used as a vicarious learning situation. However, in the application of a component skills approach to the teaching act, the general consensus is that much more work needs to be done to establish an operative application. For example, Cooper and Allen (1970) state the case for more research into modeling and microteaching in order to establish as to whether modeling should be used for training in all "component skills"[1], and as to what medium for modeling is the most effective in each "skill area". Berliner (p.23) found that for the technique of higher order questioning, both perceptual and symbolic models were equally as efficient, and questioned the need of videotape (perceptual) models for verbal techniques. Further research is required in the area of transfer of skill acquisition from a vicarious situation to a real live classroom setting. Aubertine (1967) found that transfer did occur during the training of microteaching supervisors, however more research is needed in relation to skill transfer of teacher trainees.

Critical instance sessions were used during the early developmental stages of the Stanford model (Cooper and Allen, p.2) but this approach of modeling techniques at Stanford appeared to "lack direction" and did not adequately emphasize "the teaching techniques dimension".

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[1] "Specific component skills" is the language used in the literature to describe what we call elements and techniques of teaching.

Modeling does appear to have a place within the microteaching format, but questions as to area application, and of what medium to use, leave modeling as a field for research within itself.

In the preceding paragraphs we have developed a definition of microteaching and looked at the ways in which the format of a microteaching program may vary. To use the Stanford model or variations of it as a basis for surveying and classifying microteaching programs currently in use does not allow enough flexibility in the definition and use of the microteaching technique, therefore, we have listed what we consider to be the minimal identifying elements of a microteaching program. That is,

(a) the existence of a micro situation, in terms of reduced complexity of task, reduced class size and reduced lesson duration.

(b) the existence of some form of feedback evaluating[1] the performance carried out in the environment of (a) above.

THE SURVEY

Purpose

The main aims of this survey were:

1. to establish how many, and in particular, which teacher training institutions in the Greater Melbourne Area were using microteaching techniques in their training programs for 1971.
2. to find out the purpose which each particular institution saw microteaching serving.
3. to examine the particular formats of microteaching that are being used and to examine the technical aspects of measurement and support materials used in each case.

As the survey was directed at a large range of institutions (university teacher training courses, secondary and tertiary; primary teachers' colleges and independent schools training colleges) the questionnaire in most cases was left open ended to cater for an anticipated variety of responses.

Material Covered

Letters were sent to thirteen teacher training institutions in the Greater Melbourne Area asking if they conducted microteaching programs, and if so, would they be prepared to discuss their program. Ten replies were received and of these, six institutions replied that they were using some form of microteaching in their teacher training programs. At one of the universities, two separate microteaching programs were being independently administered. That is, one microteaching program was being used for training secondary teachers, and the other microteaching program was being independently administered for a training course involving tertiary teachers. For the purpose of this survey these two programs will be treated as separate microteaching programs and be identified as 2A and 2B.

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[1] Evaluation - "to make judgements and decisions about instruction and instructional programs" Wittrock, M.C. and Wiley D.E. The Evaluation of Instruction, Holt, Rinehart and Winston, 1970, p.3.

All but one of the non-replying institutions were Education Department Teachers' Colleges, and it was later established from other Departmental Colleges that the non-replying teachers' colleges did not in fact have microteaching programs. It was also established through this closed network of teachers' colleges that no country teacher training colleges were using microteaching in their training programs.

At each interview a questionnaire was completed or discussion took place and the completed questionnaires later forwarded by mail. Each interview was approximately one hour in length.

Microteaching Defined

Using the operational definition of microteaching previously stated it can be seen from Table 1 that six teacher training institutions (2A and 2B being one institution) are using microteaching. That is, they are all using a technique where the teaching situation is scaled down in terms of task, size of class and lesson duration, and feedback on performance is being provided.

TABLE 1

Microteaching Characteristics

	Institution						
	1	2A	2B	3	4	5	6
A. Microteaching situation							
(i) Microclass, laboratory setting, real pupils.	No	No	No	No	Yes	No	No
(ii) Microclass, laboratory setting, peer groups.	Yes	Yes	Yes	Yes	Very Little	Yes	Yes
(iii) Microclass, school setting, real pupils.	No	No	Yes	No	Yes	No	Yes
(iv) Full real class, limited and full time	Yes	No	Yes	No	Yes	Yes	Yes

	Institution						
	1	2A	2B	3	4	5	6
B. Microteaching format							
(i) Diagnostic session	Yes	No	No	No	No	Yes	No
(ii) Teach	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(iii) Feedback/critique	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(iv) Replan	No	Yes	Yes	Yes	No	No	Yes
(v) Reteach	No	Yes	Yes	No	No	No	Yes
(vi) Feedback/critique	No	No	Yes	No	No	No	Yes

Four out of the seven programs listed in Table 1 are only teaching to peer groups. While appreciating that the use of peer groups is not seen by come researchers to be 'real teaching' (Cooper and Allen, 1970) it is felt there is sufficient disagreement on this point (McAleese and Unwin, 1970) to warrant it not being included as an integral part of a microteaching definition.

The microteaching formats adopted by the surveyed institutions did not in general proceed through the "complete Stanford format". However, the reasons for not implementing a complete Stanford cycle were mainly lack of finance, staff and physical resources.

Purposes of Microteaching

The results of this survey have indicated a wider use of the microteaching technique than has been put forward by the available literature. Instead of concentrating on the view that microteaching be used as a situation for practicing the "component skills"[1] of teaching, six of the seven interviewed administrators of microteaching programs saw the microteaching technique in a broader role than that of just practicing "component skills" of teaching.

TABLE 2A

Skill Development

	Institution						
	1	2A	2B	3	4	5	6
Specific Teaching Skill Development							
Microteaching used for specific teaching skill development.	Sometimes	Yes	Yes	Not formally	Not formally	No	No

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1. elements of the task of teaching or techniques to achieve the attainment of a teaching task.

Although techniques of teaching were practiced (Table 2A) replies to the question, "What role do you see a microteaching program fulfilling?" indicated that such aspects as "enabling a student to reconstruct his preconceived model of "a good teacher" in the light of his own observation of his own practice teaching and the "development of concepts and personal development and sensitization" were held as equally as important as specific element and technique practice. The overall view of the act of teaching tended to be quite different to the atomistic "component skills approach" and as such the microteaching technique was seen as useful not only as a non threat situation to practice elements of a teaching task, but also as a non threat situation where a trainee teacher can gain a greater awareness and sensitivity of himself. Although not probed by this survey, the "cosmetic effect" as reported by Allen and Ryan rather than being considered as a settling down period prior to true microteaching, may serve an important purpose in developing within trainee teachers a positive awareness and knowledge of themselves.

From the preceding paragraphs, it follows that if six of the seven microteaching programs saw microteaching serving a wider point of view than practice in the elements and techniques of a teaching task, then their use of models will not exclusively be orientated towards the modeling of "skills".

TABLE 2B

	Institution						
	1	2A	2B	3	4	5	6
Modelling							
Models of specific skills	No	No	No	No	Yes	No	No
Models of a general lesson	Yes	No	No	Yes	Yes	No	Yes

Of the four training centres who use models as part of their microteaching programs, only institution 4 used models illustrating specific instructional skills, e.g. higher order questioning, set induction and closure of lessons. The other three centres used taped segments or complete replays of demonstration lessons which were used to illustrate the concept of "a good lesson" rather than being specifically used to demonstrate a particular skill.

Institution 2B, while not using modeling of any sort did see microteaching as being primarily a method to be used for the teaching of specific instructional "skills".

Support Materials

Following the overseas trend, the seven microteaching programs surveyed all made use of videotape as providing the primary mode of feedback. Three of the seven respondents also used audio tape, but the use of audio-tape was secondary to that of videotape.

Software support equipment in the form of formal rating scales, evaluative instruments and explanatory handouts were only used in three cases, with institution 1 being the only establishment using a formal rating and evaluative scale (the Teacher Concept Scale).

In all cases supervisors were used in the observational role as traditionally set in practice classes, but only institution 1 perceived the necessity of giving special training to supervisors used during microteaching sessions.

TABLE 3

	Institution						
	1	2A	2B	3	4	5	6
Support Materials							
A. Equipment							
Videotape	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audiotape	Yes	Yes	No	No	Yes	No	No
Software support equipment	Yes	Yes	Yes	No	No	No	No
B. Supervisors							
Present during microteaching	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Present during feedback session	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Do supervisors undergo seecial training?	Yes	No	No	No	No	No	No
C. Modeling							
Are models used?	Yes	No	No	Yes	Yes	No	Yes
What media is used?							
Film	No	No	No	No	Yes	No	No
Videotape	Yes	No	No	Yes	Yes	No	Yes
Audiotape	No	No	No	No	Yes	No	No
Live	No	No	No	No	Yes	No	No

Evaluation

All institutions, except No. 1, used subjective type reporting by supervisors to evaluate teacher performance during a microteaching cycle. Institution No. 2A used a "home made" rating scale, but insisted that this in no way could be considered as a formal evaluation.

TABLE 4A

	Institution						
	1	2A	2B	3	4	5	6
Evaluation							
Is there formal evaluation of teacher performance?	Yes	No	No	No	No	No	No
Evaluation from							
a. Supervisor	Yes	No	No	No	No	No	No
b. Trainee (self evaluation)	Yes	No	No	No	No	No	No
c. Pupils/peers	No	No	No	No	No	No	No
Are independent feedback facilities available on request from the trainee teacher?	Yes	No	No	No	Yes	No	Yes
Is there an initial diagnostic session?	Yes	No	No	No	No	Yes	No

Even though microteaching may not be seen as a "specific skills developer" by many of the institutions surveyed, this attitude should not necessarily negate the idea that formal evaluation of teaching need not apply. The arguments for and against formal evaluation of teaching performance are not subjects for this survey, however, it would appear that a more meaningful notion of improvement would be conveyed to supervisors, trainees and pupils alike, if some formalized type of evaluation was used. (Berliner, p.3-4)

Self Analysis

The place of self analysis in the microteaching format is as yet uncertain, although an optimal use of microteaching may be a situation where self viewing facilities of past performances for trainee teachers are made available on request. Cameron and Cotrell's (1970) study indicates the possibility of this suggestion in that they found self-evaluation was equally as effective as telephone feedback/critique sessions from master teachers in situations where teachers were unable to have supervisors actually present in the classroom. The provision of video self evaluation facilities available on request to trainee teachers in this survey occurred at institutions 1, 4 and 6, with institution 6 providing only limited facilities for this.

Evaluation of the Microteaching Programs

Evaluation of any program by a practitioner depends to a large degree on how well the program achieves previously stated aims. Responses to the question, "What role do you see a microteaching program fulfilling?" ranged from "to enable a student to reconstruct his pre-conceived model of "a good teacher" in the light of his own observation of his own practice teaching to "improving teaching performance" to "teaching the development of concepts" and "as another technique in the total learning experience for teaching practice", and as such the evaluation given by each practitioner should only be taken as being relevant to that particular institution.

TABLE 4B

	Institution						
Evaluation of Micro-teaching programs	1	2A	2B	3	4	5	6
1. By itself	Very satisfactory	Very poor	Doubtful in terms of skill approach	Successful (qualified)	Fair	Effective	Some reservations
2. Compared with a non microteaching situation	Superior	N.A.	In the long term - little difference	N.A.	N.A.	Superior	N.A.

Three of the seven microteaching programs surveyed rated microteaching favourably in terms of achieving stated aims, but only two institutions definitely stated that they considered microteaching as superior to a "normal education program". Institutions marked with the responses not applicable (N.A.) all felt that either because of the short period of implementation of microteaching programs, or because of the inability to pursue follow up studies on the effect of microteaching training, that it was inappropriate to answer this question.

Research and Problem Areas

TABLE 5

	Institution						
Research	1	2A	2B	3	4	5	6
Conducting or have conducted research projects on microteaching.	Yes	Yes	No	No	No	No	No
Problem areas encountered							
Equipment (support and hardware)	*	*	*		*	*	
Personnel			*	*	*	*	
Administrative		*	*		*	*	
Adverse trainee/academic reactions				*	*		*
Pupil/School accessability	*			*		*	
Others		*		*			*

* indicates problem areas encountered by the institution

The most significant feature of this survey was that all institutions who were conducting microteaching sessions in their courses all admitted that there were significant problem areas which hindered the adoption of a desired microteaching format.

The two most occurring problems were:

1. the use of C.C.T.V. in microteaching. Four institutions expressed concern about the lack of C.C.T.V. equipment; this lack being caused by deficiencies in the equipment held by the people involved in microteaching (e.g. not enough videotape recorders), or by the forced time sharing of equipment with other faculties. The lack of availability of technical personnel for operating and maintaining the television equipment was another common problem closely related to the lack of hardware.

2. Problems of administration and logistics. In most cases because microteaching was not completely integrated into education courses and was competing in terms of time against other subject areas, there was a finite time availability to conduct microteaching sessions and therefore a limit on the number of students who could undergo a microteaching experience. In institutions 3 and 4 where large numbers are involved students attend only one or two microteaching sessions and it appears that the price of large numbers is lack of flexibility with equipment, format and supervision in the microteaching program.

TABLE 6 - Statistics

	Institution						
	1	2A	2B	3	4	5	6
Staffing							
Numbers of:							
a. Academic staff	3	4	7	22	11	1	4
b. Technical staff	1	1	2	0	4	1	2
Trainee teachers	15	22	80	285	120	60	250
How many microteaching sessions does a trainee teacher attend?	2-3	1-2	3	2	1	2	1-3

Conclusion

The results from this survey indicate that there are divergent views on the purpose of microteaching, focusing around the proposition as to whether teaching can be analyzed into identifiable tasks, elements and skills, which can themselves be subjected to formal evaluation, as against the developmental approach to individual personality and presentation evaluated in a subjective manner.

Concern over what is and what is not microteaching and for what purposes microteaching should be used has become in some instances an area of rather circuitous argument. It appears that too much emphasis was being placed in regarding the Stanford microteaching format as an element of definition. This approach to defining microteaching does not appear to allow enough flexibility in the application of microteaching, so to overcome this problem it is suggested that practitioners of microteaching make a clear distinction between definition and format. Definition would identify the universal minimal defining characteristics of a microteaching situation, but format, purpose and content of the microteaching cycle would be in the hands of each individual practitioner. As a result of this survey we have stated in earlier sections of this paper what we believe to be a minimal definition of a microteaching situation.

Turning to more specific matters of this survey, microteaching, as practiced in teacher training institutions in the Greater Melbourne Area during 1971, is being used in a variety of situations for a variety of purposes. However, the majority of practitioners clearly indicate that microteaching has been adopted without relevance to learning theories and overall integration to educational programs. The lack of software support materials used in the microteaching session of institutions surveyed is indicative of this trend.

An indication that microteaching in some cases has been adopted in haste, with scant attention being paid to theory, is the overemphasis placed by all institutions on the role of C.C.T.V. in microteaching. American and British researchers have continually re-emphasized that the use of video equipment is not essential to the microteaching function. Evidence from Berliner (p.23) indicates that the use of videotape when practicing verbal skills may be superfluous, audiotape, based on research evidence, being considered as equally efficient in this area.

The actual gain from some of the microteaching programs reported in this survey must be doubted. Given the high capital cost of purchasing and maintaining television equipment it would appear that programs where trainee teachers undergo only one or two microteaching experiences gain very little in the way of achieving significant behavioural changes or achieving competence in the practice of an element of a teaching task. The frequency of exposure to the microteaching technique (Babin, p.96-99, Cooper and Allen, p.14) would appear to be an important factor in achieving significant behavioural changes or satisfactory levels of competence in the practice of particular teaching tasks. But the number of microteaching sessions available becomes dependent on so many variables such as trainee numbers, staff numbers, and at a different level, the degree of integration and acceptance within a school of education of a microteaching program.

It became evident from the questionnaires and interviews that microteaching in some institutions was not being developed further due to doubt arising from some sections of methods and academic staff as to the effectiveness of microteaching in a teacher training environment. Although microteaching is not considered a new technique in the United States in the sense that it is accepted as being superior to a non microteaching situation, it is still considered as being in the research and development stage (Allen and Ryan, Berliner, Cooper and Allen). Doubts expressed during this survey on the effectiveness of microteaching must at this stage be considered as premature or lacking research evidence.

The situation of microteaching as is used by teacher training institutions in the Greater Melbourne Area at the present highlights the need for a solid body of theory, backed by research, to point the way out of the current amorphous situation and a need on the part of individual institutions to develop an understanding of the theory and research evidence before clearly stating what the objectives and rationales of each individual microteaching problem is to be. This survey also points to the urgent need for agreement on the terminology used within the field of microteaching before any meaningful communication between researchers and practitioners can take place.

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MICROTEACHING SEMINAR REPORT

As a result of approaches made by Mr. John McArthur on behalf of the teaching methods staff of Melbourne University, the Higher Education Research Unit conducted a seminar on microteaching programs within teacher education courses.

Eighteen members of Melbourne University methods staff attended the seminar, which ran from 9.30 am to 1.00 pm on the 9th November, 1972.

The format of the seminar was as follows. As an introduction a videotape titled "This is Microteaching" was shown, then the seminar proceeded in a formal manner examining the problems and preparation needed for the four identifiable phases of implementing a pre service microteaching program, that is for the

1. Planning stage
2. Preparation stage
3. Implementation stage
4. Transfer stage.

Research evidence was submitted on each of the points both from outside research and tentative findings and experiences from the Higher Education Research Unit's own research project on microteaching.

After this formal presentation a discussion period began with the showing of videotaped microteaching segments from HERU's research project. Discussion that followed was geared mainly to the implications contained within the formal address to the needs and aspirations of the situation at Melbourne University.

At the conclusion of the seminar the Melbourne University staff decided to come back at a later date to HERU with their plans for a microteaching program for next year, with a view that joint discussion would result in a more meaningful application of the microteaching technique.

J.I. MALLEY

24th November, 1972.

MICROTEACHING SEMINAR

What does microteaching involve?

four stages of involvement:

1. Planning project
2. Preparation - supervisors
   - trainees
3. Implementation
4. Transfer

Questions to be considered at each stage:

1. Planning
   - a. Ask yourself why do I want to use microteaching?
   - b. Do you believe that theteaching act can be broken down into small segments of tasks and skills.
   - c. If so then what are the most important tasks and skills?
   - d. Can these skills be practiced within a microteaching situation?
   - e. How are you going to present these 'skills' to the trainees?
   - f. Can you structure your skills so that evaluation of achievement or non achievement of trainee performance can take place?
   - g. What criterion levels of achievement are you going to use?

2. Preparation
   - A. Supervisors
     - a. Are you going to train supervisors in using the component skills approach to analyze teacher behaviour?
     - b. Are you going to train supervisors in supervising techniques?
   - B. Trainees
     - a. How many trainees are to undergo microteaching?
     - b. For what skills and how many sessions per skill should a trainee undergo?
     - c. With what type of feedback?
     - d. Are you going to use symbolic or perceptual models of the skills to be practiced?
     - e. What type of preparation are you going to give the trainees prior to microteaching?

3. Implementation

   a. Is your microteaching program going to be a one only affair during the year, or will it be recurring?

   b. At what time(s) during the year are you going to run your microteaching program to gain maximum effectiveness from it.

   c. Do you have the staffing resources to give a full scale microteaching program?

   d. Do you have the physical resources? (Not necessarily T.V. but at a more basic level, the number of rooms).

   e. What type of format will you use?

   f. Will you use peer evaluation or only supervisor evaluation?

   g. Will you use real pupils or peer groups? (this question could be a red herring to the purpose of microteaching).

   h. Will you run diagnostic tests to screen out those who need microteaching?

4. Transfer

   Very little work has been done in this area:

   a. Can you be sure that the practice of a skill will lead to successful intergration into the complete teaching behaviour in a real full scale situation?

   b. Will you follow-up microteaching training during teaching rounds? This may affect the type of feedback you give during teaching rounds.

The above questions are not intended to "knock" microteaching, but rather are attempting to show you that there is more to microteaching than putting trainees in front of a T.V. camera and asking them to teach for five minutes. It is our opinion that unless most of the above questions are answered, the implementation of a microteaching program in a piecemeal and uncoordinated fashion will involve you in much expense in terms of time and resources, for little if any gain.

Perhaps the most important aspect of any microteaching program is the amount of planning, preparation and forthought that goes into the developmental stage of microteaching within any institution.

The next important consideration is the formulation of some concept of teacher behaviour which provides a rationalization for which you can use as an explanation for asking trainees to practice aspects of teaching in a reduced classroom situation.

What then goes on within a microteaching program is largely determined by the aims that you want it to achieve.

UNIVERSITY OF MELBOURNE
FACULTY OF EDUCATION

34 0484 PARKVILLE 3052

November 10th, 1972

Mr. J. Clift,
Director,
Higher Education Research Unit,
Monash University,
Wellington Road,
CLAYTON, 3168

Dear John,

On behalf of the Method Staff and the representatives of the Centre who attended yesterday I would like to convey our appreciation of the time and effort you and your staff put into the Seminar on Microteaching. We found very great value in the opportunity to discuss your programme and methods of operation and have a much better basis on which to commence thd very necessary replanning of our own course. In particular we appreciated very much the very capable handling of the seminar by Jeff Halley and the wealth of material he put before us.

Yours sincerely,

John McArthur

John McArthur.